

Dental

Abstracts

a selection of world dental literature

AMERICAN DENTAL ASSOCIATION

Volume 1 • Number 12

DECEMBER 1956

VOLUME 1 NUMBER 12 DECEMBER 1956

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Abstracts

Lon W. Morrey, D.D.S., editor

N. C. Hudson, assistant editor

AMERICAN DENTAL ASSOCIATION

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Published monthly by the American Dental Association at 1009 Sloan Street, Crawfordsville, Indiana. Entered as second class matter at the Post Office at Crawfordsville, Indiana under the act of March 26, 1956. Editorial and executive offices, 222 East Superior Street, Chicago 11, Illinois. Printed in U.S.A. Subscription \$6.00 a year in U.S.A.; \$7.00 foreign. Single copy \$1.00. Issue of December 1956, Vol. 1, No. 12. Copyright 1956 by the American Dental Association. All expressions of opinion and all statements of supposed fact are those of the author of the abstracted article and are not to be regarded as expressing the views of the American Dental Association unless such opinions or statements have been adopted by the Association.

**Dental
Abstracts
has
these
purposes**

1. *To present a selection of pertinent literature representative of all points of view within the profession;*
2. *To provide, by a few hours' reading each month, a survey of the significant advances being made by dentistry throughout the world, as reflected in current dental literature; and*
3. *To supply enough data in each abstract so that the reader may determine whether he wishes to refer to the original article for more complete information.*

The abstracts are grouped in broad classifications. The specialist will learn from this periodical of work done in other fields as well as in his own. The general practitioner will be able to keep abreast of modern knowledge in the various specialties. Articles from which abstracts have been made are on file in the Library of the American Dental Association and may be borrowed by members of the Association. Requests for articles should be addressed to the Bureau of Library and Indexing Service, American Dental Association, 222 East Superior Street, Chicago 11, Illinois. Only three articles may be borrowed at one time, and they may not be kept longer than one week. No charge is made to Association members for this service.

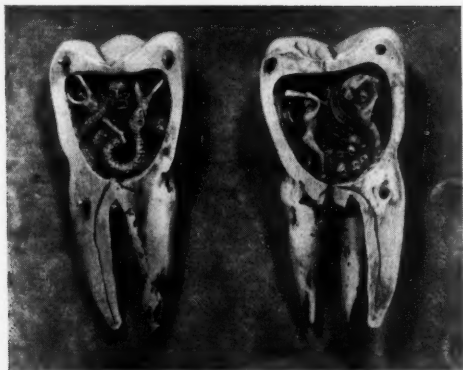


Figure 1 The toothache devils, an Italian ivory carving (1800 A.D.)

Professional activities



History

History of dentistry: the professional collection of the German Dental Association (Die berufsgeschichtliche Sammlung des Bundesverbandes der Deutschen Zahnärzte e.V.)

F. H. Witt. *Zahnärztl. Mitt.* 44:200-202
March 15, 1956

History of dentistry plays an important part in the curriculums of German dental schools. Students, to become eligible for final examination, have to prove attendance in at least one course on this subject. Unfortunately, most of the new dentists, after having obtained their degrees, quickly lose interest in the history of dentistry. Only a small group of German dentists have joined the German Association for the History of Medicine, Dentistry, Natural Sciences and Technology, the association which is devoted exclusively to research on and study of the history of these sciences.

At present, only a few outdated and therefore more or less obsolete textbooks on the history of dentistry are available in Germany. The German Dental Association, however, plans to publish a

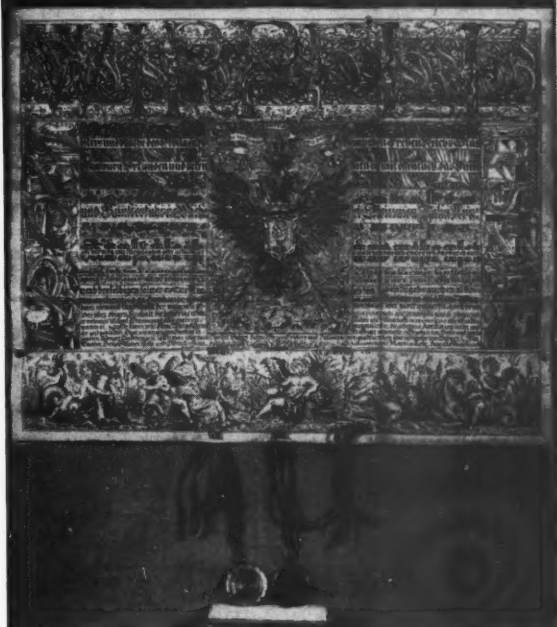


Figure 2 Diploma given to Michael Steinmetz, dentist, by the city of Augsburg, permitting him to practice freely his art (1678 A.D.)

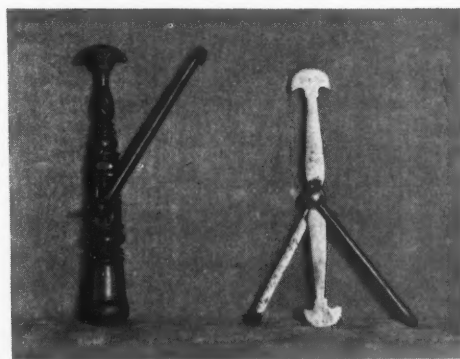


Figure 3 Two "pelicans." Left: Italian. Right: German (both around 1500 A.D.)

series of new textbooks partially devoted to this subject. In Cologne-Lindenthal, the association possesses and exhibits a collection of historic paintings, etchings and drawings, ancient dental instruments and apparatuses, originals and replicas of the first primitive artificial dentures made of wood, ivory or bone, the first porcelain teeth, and, in a special exhibition, the development of dental instruments from primitive tooth smashers



Figure 4 *The Dentist*, oil painting by Pieter Quast (1606-1647), original in the possession of the German Dental Association



Figure 5 *The Dentist*, oil painting by Jan Victors (1620-1682), original in the possession of the German Dental Association

and pelicans to modern forceps and ultrasonic drills.

The valuable art collection and a specialized dental library (containing books from the Dark Ages to the present time) are the main attractions of this small but interesting museum. A collection of paintings depicting St. Apollonia, the patron saint of dentistry, archives containing more than 1,000 portraits of prominent dentists, and a compilation of reports, agendas, full particulars and minutes of the German Dental Association and its affiliated societies, complete the exhibition.

Organization

The dental guild

Editorial. *Brit.D.J.* 100:313-314 June 5, 1956

The Representative Board of the British Dental Association at its April 28 meeting adopted the following resolution on the recommendation of the General Dental Services Committee: "That . . . the formation of a dental guild, constitutionally independent of and separate from the British Dental Association, is desirable."

The British Dental Association is a company registered under the Companies Act. One of the restrictions contained in the Association's Memorandum forbids it to organize among its members any sort of restrictive practice; this would prevent the Association from instigating a withdrawal or a limitation by its members of their professional services.

Since 1949, when the first cut in remuneration in the general dental services was imposed, there has been a growing feeling among Association members that, when it comes to a contest with a Government Department, the profession needs "every weapon in its armoury." This feeling has been caused in part by a series of adverse and arbitrary decisions on pay made by the Ministry of Health, and has been reinforced by the fact that the dental profession has not had the right to demand a reference to arbitration on any of these decisions. Many members have wondered whether the absence of the power to organize a partial or complete withdrawal from the National Health Service might not be a serious handicap to the profession in its negotiations with the Government. The example of the British Medical Guild, backed by a fund of over half a million pounds built up since 1911, has been of particular interest. Many physicians believe that the mere existence of their guild was a deciding factor in securing Government agreement to refer the problem of medical remuneration to Mr. Justice Danckwerts.

Sixteen leading members of the dental profession selected from the Conference of Local Dental Committees (a group independent of the Brit-

ish Dental Association) and from the General Dental Services Committee are now taking steps to complete a trust deed establishing a dental guild.

It is hoped that the profession will never be forced to such desperate remedies as an organized withdrawal from the National Health Service. No one can say, however, that the profession will at no time be subjected to such extreme provocation and injustice that it will be driven to seek more than reasoned argument and skilled negotiation can win. It is the duty of leaders of the profession to plan for the future. The day the guild is needed to go into action will be many years too late to start the tasks of setting it up and collecting the large funds it needs to make it effective.

This will cost you only six dollars

Chron.Omaha Dist.D.Soc. 19:297 June 1956

The Omaha District Dental Society has arranged to have an announcement appear in the coming edition of the Omaha telephone directory classified section. The announcement reads in part as follows:

"Membership in the Omaha District Dental Society stands for:

"1. Dentists who by their preparation, qualifications, character and mode of practice have been approved for membership in the state and national groups of organized dentistry.

"2. Dentists who are eligible to meet monthly with their fellow members for the exchange of professional information.

"3. Dentists who are eligible to participate in dental society clinics, lectures and forums for the betterment of your oral health.

"4. Dentists who are eligible for further advanced study in specialized fields in any of the recognized dental colleges in the U.S.A.

"5. Dentists whose primary interest is to provide the highest possible quality of service to the public.

"For further information call Ha. 5440.

"In emergency call Ha. 5440."

The society estimates that the cost of the announcement will be six dollars per member.

The Fédération Dentaire Internationale

Obed H. Moen. *J.A.D.A.* 53:69-70 July 1956

The Fédération Dentaire Internationale—dentistry at the world level—embraces about 50 national dental associations, and meets regularly to discuss mutual problems. About 3,500 individual dentists throughout the world are "supporting members."

Although not every dentist can sit in on the international discussions of the F.D.I., representative groups of dentists from all countries can attend each meeting and carry back to their fellow practitioners and dental organizations the basic thinking and conclusions from such meetings.

The F.D.I. *News Letter* gives information from the world of dentistry to all F.D.I. members regularly. The *International Dental Journal* reports studies dealing with dental science, literature and organization. Dentistry's only entree into the World Health Organization is through the F.D.I.

Dentistry, in order to continue to advance, must face worldwide problems as they present themselves. Supporting membership in F.D.I. is available to all members of the American Dental Association at \$10 annually.

Welcoming the new graduate

J. P. Beukema. *J.Michigan D.A.* 38:190-192 May 1956

Three years ago the Kent County Dental Society of Grand Rapids, Mich., inaugurated a program designed to encourage new dentists establishing practices there to join the organization. The main qualification for membership is active membership in the West Michigan Dental Society.

The program is conducted by a standing committee, the welcoming committee. The aim is to ease the burden of setting up a dental practice for incoming dentists, by conveying pertinent information to them.

A dinner meeting is held in September each year for officers of the two societies, members of the welcoming committee, and guests—the new dentists. The guests are welcomed. Histories of the two societies are related. Problems of dental

law and ethics, office procedures, cost determination, insurance, taxes and community affairs are discussed. The information given new dentists is compiled from questionnaires sent members of the Kent County Dental Society.



Interprofessional relations

Medical evaluation of the dental patient

Francis L. Colpoys. *Massachusetts D.Soc.J.*
5:9-10 April 1956

Medical evaluation of the preoperative patient has several advantages. Previously undiagnosed medical abnormalities may be discovered and possibly corrected preoperatively. The recognition of these abnormalities may modify the surgical operation, influence the choice of anesthetic or preoperative medication, and will alert the dentist and the anesthetist for any sign indicating an impending crisis in the involved organ.

The dental patient should be medically evaluated. An inquiry into previous rheumatic fever, chorea, heart murmurs, high blood pressure, coronary pain or bleeding tendencies may lead to consultation with the patient's medical general practitioner or the internist. Several medical entities may be affected directly by dental procedures.

A severe complication of rheumatic heart disease is subacute bacterial endocarditis. The offending organism is usually *Streptococcus viridans*, a common organism in the oral cavity; about 20 per cent of instances of subacute bacterial endocarditis develop within several weeks of a dental procedure. A transient bacteremia follows the extraction, filling or even the cleaning of teeth. This bacteremia is usually harmless but the bacteria may localize and multiply on a deformed heart valve, with the resultant severe illness. This situation is preventable with the use of antibiotics. Penicillin is the most effective antibiotic against streptococcal infections in general and *S. viridans* in particular. A dosage of 600,000 units of procaine penicillin G in a 1 cc. intramuscular suspension may be given on three suc-

cessive days, to protect the patient against the expected bacteremia.

There is no absolute contraindication to any dental procedure for the patient with coronary sclerosis, but precautions should be observed. Anoxia and sudden fluctuations in blood pressure must be avoided. If a patient is having frequent attacks of chest pain, any operation should be postponed until a more asymptomatic state. After a coronary thrombosis, dental procedures (particularly extractions) should be postponed for from three to five months.

If patients with hypertension receive a period of bed rest and sedation prior to the dental procedure, lowered tension and fewer complications may result.

Persons with a positive family or personal history of bleeding should receive a careful hematologic examination. These patients should have extractions while in a hospital where transfusions may be utilized if necessary.

Morbidity and mortality from medical complications may be eliminated if the dentist will take a brief pertinent medical history of his patients, insist on any indicated medical consultation and observe the physician's recommendations.



Education

Gerontology-geriatrics: a challenge to dentistry

Paul W. Vinton. *Frater* 56:4-5 May 1956

This year the University of North Carolina School of Dentistry is offering a formal course in gerontology and geriatrics, sponsored by the Department of Prosthodontics, to its senior class. Guest lecturers will discuss the fields of public health statistics, biochemistry and the nutritional problems of the aged, physiology and the aging process, sociology, anthropology, economics, old age pension problems, psychology, psychiatry, medical research in geriatrics and gerontology, and religion.

Such a course is justified by the fundamental changes which have occurred in American so-

ciety. Since 1900 the percentage of persons above 35 years of age has increased. Those 65 years old and older have quadrupled in number from 1900 to 1950, from about 3,000,000 to almost 12,500,000. They now constitute 8.1 per cent of the population. This age group is expected to constitute from 11 to 12 per cent of the population in 1975.

The chief factors accounting for the expansion of this age group are the decline of the birth rate since 1900, the decline in immigration since 1914, improved health and standards of living, and advances in medical science.

The dental profession must develop in its students that measure of knowledge and compassion which older patients need. If dentistry fails to establish an acceptable solution to fundamental population changes as they affect the dental profession, a glorious opportunity for service will be irrevocably lost. If dentistry does not find the solution to this problem, a solution will be established elsewhere and superimposed on the dental profession. The prosthodontist of the future must also be a gerontologist.

Oral diagnosis and x-ray: a method of teaching dental interns in an Army hospital

Norman H. Rickles. *Mil.Med.* 118:574-576
June 1956

During his six weeks in the section of oral diagnosis at a teaching Army hospital, the dental intern will see about 500 patients, of whom about 50 will need emergency treatment (which he renders), 400 will require examination and routine treatment, and 50 will be patients with multiple problems. The guidance of the Chief of Section enables the intern to become familiar with the signs, symptoms and tests for the etiologic factors comprising a "toothache."

The intern, after making the diagnosis, will treat many of the emergency patients under proper supervision.

A typical dental examination consists of an impression of the patient's general health, the appearance of his exposed surfaces and his reaction to his environment; a thorough intraoral examination. Arrangements are made for roentgenograms

and study models, and all abnormal findings are recorded. The intern and Chief of Section decide what the ideal treatment for the patient would be, and define the actual plan of treatment in accord with existing personnel and equipment.

In each of the problems that may arise—reconstruction, oral lesions, presurgical evaluation and periodontal conditions, for instance—the chiefs of the other dental sections and members of the medical staff often are consulted by the dental intern.

All four dental interns participate in the bi-weekly informal seminars moderated by the Chief of Section.

Leading specialists from nearby dental schools present lectures and demonstrations.

By the end of his stay in the section the dental intern should have attained a minimum degree of proficiency in evaluating oral conditions, and a reasonable facility for suspecting general or systemic complications. He must take at least two patients through a complete work-up, making the principal and lesser diagnoses, and conceiving treatment plans. He must also demonstrate his facility in oral roentgenology by exposing, processing and interpreting five full-mouth series of roentgenograms and five occlusal films.

The influence of dental education on the profession

B. Cohen. *J.D.A.South Africa* 11:159-163
May 1956

The trend in dental education is to ensure that every aspect of clinical instruction is correlated with the fundamental principles on which it is based. There should be no gap between preclinical and clinical studies. In recognition of this necessity, the length of the dental course at the University of Witwatersrand recently was increased to five and a half years, by the inclusion of a course in oral medicine; the subject is intended to embrace the diagnosis of lesions other than dental within the oral cavity, and the application of biologic research to their treatment. It is designed to unify preclinical teachings in physiology, pathology and pharmacology with general medicine.

If more dentists were competent to recognize such lesions, their rarity might be less remarkable. The ability of the practicing dentist to save an occasional life through early or astute diagnosis offers a rewarding mental uplift.

In South Africa the stress laid on comprehensive preclinical training has enabled dental graduates to enjoy intellectual equality with their medical colleagues. This educational parity has resulted in the two professions being governed by the same council, and sharing the same courtesy title.

The status of dentistry in South Africa is not something which has been achieved easily, nor is it likely to be maintained or improved without justification. Those responsible for dental education are also responsible to the profession as a whole to see that high standards which have been attained are not relinquished.

The increase of the B.D.S. course in South Africa to five and a half years has not resulted in a diminution in the number of applicants seeking admission to dental school.

In Britain, in the United States of America (where the status of dentistry is perhaps higher than anywhere else in the world), in Canada, Holland and Israel, the course in dentistry extends over six years. There was a time when medical as well as dental courses occupied only three years; the need for extension has been governed by advancing knowledge and not by economics.

The number of dentists in South Africa is increasing steadily each year, and there appears to be no danger that the deterrent (if any) of a longer course of study could exert an untoward effect. The time is propitious for consolidating the advances made by those who pioneered dental education, and for assisting rather than resisting the momentum of scientific advancement.

Dental education in Lebanon

Puzant H. Hadidian. *Lebanese D.Mag.* 6:32-38 Jan. 1956

Beirut is the leading center of medicine in the whole Near and Middle East. The two medical schools, American and French, have attracted patients from a radius of a thousand kilometers and

have trained the majority of physicians and surgeons practicing in the region.

The acceptance of dentistry in the countries of the Middle East as a legitimate branch of medicine is comparatively new. The American Dental School was established in 1913 and the French School in 1920. Until then the country's dental needs were met predominantly by the *praticien dentistes* who had no regular professional training but were licensed by the government.

After the two dental schools had been established, small groups of graduate dentists made their presence felt in the capitals and big towns of these countries. The people learned to recognize the value of scientific dental care. In 1925 the government issued a law forbidding any further granting of licenses to dentists who did not have a university diploma.

The dental school of the American University of Beirut set a high standard of education similar to that of the best schools in the United States. The French dental school, following the French system of education, sought to give its students an adequate training to meet the needs of the country.

Circumstances obliged the American University to close its dental school in 1940. This was a great loss for the country. It deprived the practicing graduates in Lebanon and the surrounding Arab countries of the inspiring and stimulating influence that the school as a scientific center exerted on the dental profession.

With the closing of the American school, the leadership of the profession fell to the French school.

The average quality of dentistry as practiced in Lebanon is not high, and in certain aspects has retrogressed. The rubber dam is no longer in use. Well-fitting inlays are seen but rarely. Crowns are apt to be shapeless. Black's principles for fillings are no longer observed. Nerve block anesthesia is shunned. Examinations for a government license have become cursory.

To correct the situation the following steps are suggested:

1. The American University of Beirut should reconsider the reopening of its dental school.
2. The French School faculty should seek to remodel its dental school into a first-class institution.

3. The leaders of the French School and the Nakabi (National Dental Association) should cooperate to establish postgraduate or refresher courses.

4. Average dental fees should be increased, provided the quality of dental service is also raised.



Dentistry in government

Report of the Waverley Committee

Editorial. *Brit.D.J.* 100:179 April 3, 1956

The Forces Medical and Dental Services Committee, set up in 1953 to review the arrangements for providing medical and dental services for the Armed Forces at home and abroad in peace and war, has published its report and recommendations. The dental branches of the three services have had a long, hard struggle to get recognition of the necessity for their establishment on a basis which would attract recruits. If the recommendations of the Waverley Committee were accepted, a young man could look to any of the three services for an opportunity for a satisfying professional life.

The Army requires 457 dental officers; of the 242 serving, less than one third are on a regular engagement. The position in the other two services is not quite so serious. The report agrees with the British Dental Association's viewpoint that the three services should retain their identities and that the rates of pay and general service conditions of dental officers should be the same as those for medical officers. The report recommends improvements in the arrangements for posting and for allocation of quarters for married officers and the provision of facilities for educational grants and places in schools for the children of dental officers.

The Committee did not accept a suggestion of the Association that suitable boys should receive financial assistance towards their professional training if they agreed to make a career in one of the services. The Committee recommended that

there should be one post of brigadier and one of air commodore for dental consultants. The report recommends that the prospects of specialists for a career should be at least as attractive as those offered to nonspecialists.

The government apparently has disregarded the advice of the Committee that "the pay of dental officers should be the same, rank for rank, as that of medical officers." The disparity between the pay of dental officers and that of their medical colleagues has in large part been retained.

There can be no estimate yet of the benefits the report will bring to the Armed Forces. Members of the Committee are to be congratulated on their detailed consideration of the many difficult problems.

Career guidance and programming for Dental Corps officers

Oscar P. Snyder. *Mil.Med.* 118:572-573
June 1956

Just because a dental officer has received specialized training and attained the rating of a Diplomate of a Board, he does not thereby become ineligible for an administrative assignment. The skilled and successful professional man necessarily must acquire considerable administrative ability.

The Army Dental Corps should have dental specialists in a percentage commensurate with average national levels. A greater ratio is desirable because of the dispersion of the Armed Forces and because in many places there are no civilian specialists to call on for consultation. The Dental Corps needs more specialists and more skilled administrators.

The Dental Corps is as interested and concerned in the career pattern of its civilian component officers as of those in the regular Army. The younger individual need have no great concern as to the precise pattern he pursues. The basic course for dental officers, as offered at the Army Medical Service School, is fundamental for every officer entering the service. After such training the officer should have a period of field service in some location where he is in touch with

troops and the functioning of combat units. At this time the dental officer supplements his professional and administrative knowledge by functioning with senior officers of all categories. He enhances his skill in general dentistry, or perhaps is attracted to one or more of the dental specialties. Attendance at professional courses, or further administrative training, may follow the period of troop duty. The plan for these various undertakings is well established, and there is little difficulty in pursuing a pattern which is suitable and appropriate.

In all branches of the armed service, the individual who has pursued a well planned program seems to reach the higher brackets in his career with a feeling of assurance.



Civil defense

Dentists in the Danish Army Medical Corps (Tandlaeger i forsvarrets sanitetsberedskab)

G. Fasting-Hansen. *Tandlaegebl.* 59:576-584
Aug. 1955

In the event of war, the Danish Army Medical Corps will take over all hospitals, dental and medical institutes and clinics. In accordance with a law passed in 1949, preparations for such a transfer have to be made in peacetime.

Quarantine stations and field hospitals for people, to be evacuated in case of emergency, have been erected partially or are in the planning stage. Practicing dentists already have been assigned to serve as staff members.

In the event of war, all Danish dentists, young or old, male or female, fit or unfit for military service, will be inducted into the Danish Army. Then, their individual usefulness will be evaluated.

At present, the preliminary training of drafted dentists consists, in addition to courses in all branches of dentistry, of general medical and surgical education. After this training, the young dentist becomes a medical officer. The main objectives of peacetime training are as follows: (1)

to enable dentists to serve as assistants in major operations; (2) to promote close cooperation between dentists and physicians serving in the Army and (3) to acquaint dentists with duties not directly related to dentistry.

It is anticipated that dentists will be in charge of the ambulance service and of some of the quarantine stations near the battle lines. They will give the provisional treatment to wounded soldiers, and will organize the transport of patients and the evacuation of parts of the population.

Dentists must be able to make roentgenographic examinations and to give roentgen ray treatments.

In the hospitals, removed from the war theaters, the dentists will exercise duties connected with dentistry only. Every regiment, lazaretto and municipal ambulance service will have at least one experienced dentist.

Mobile dental and medical units already have been formed which are staffed with one dental specialist for each dental branch. An advisory board for all military-dental problems in peace and wartime is under the leadership of a military dentist of high rank.



Hospital dental service

The development of the dental clinic of the City Hospital of Schenectady, N.Y.

Samuel Podoloff. *Harvard D.Alumni Bul.* 16:5-8
Feb. 1956

The Schenectady City Hospital, which is controlled by the city Department of Health, has a normal capacity of 35 beds, and is now devoted chiefly to the care of poliomyelitis patients who come from communities within a 50 mile radius. The polio patients who remain at the hospital for any protracted period are those whose chances of recovery are limited—who become dependent on "iron lung" respirators, rocking beds for forced diaphragm breathing, and Monaghan portable respirators. These patients are completely de-

pendent on the services of nurses, aides, physiotherapists and doctors. Several dentists serve the patients on a voluntary basis.

In 1952 the hospital had a dental staff but no dental instruments or facilities. Appropriations to purchase dental instruments were obtained from the hospital auxiliary, the Kiwanis and Lions Clubs, the county dental society and the dental society auxiliary.

The hospital supervisor was consulted and a plan was worked out whereby dental services could be performed on patients who could not breathe without artificial help, by having the patient use a rocking bed, with a Monaghan portable respirator strapped to the patient's chest. A few patients could breathe unaided for short periods with the bed stationary. When necessary, the dental operation was stopped and the bed rocked for five minutes to rest the patient from the breathing effort.

Problems of treating various poliomyelitis patients are described.

In June 1954 a permanent dental operating room was established on the first floor of the hospital. The doorway from the corridor was widened to permit the entry of a rocking bed. The patients welcome the new arrangement, for a trip to the dental clinic provides a change in route. There is no elevator in the hospital. Beds are guided down an outside covered ramp, and are pulled back up the ramp by a winch. Some patients, who can sit, come down in a wheel chair and are transferred to the dental chair by an orderly. To provide dental treatment for patients who cannot be moved, the portable dental equipment is rolled upstairs.

Chronic bed patients feel unsafe unless lying in the center of the bed. The desired angle of inclination of the head of the bed varies with different patients. Some patients can turn their heads in only one direction. Those who have learned "frog breathing" are difficult to work with because of the constant movement of the oral musculature. Suction apparatus must be available at all times.

Three young dentists have volunteered their services, and each holds a clinic for one period each month, six months per year, on either a Sunday morning or a free afternoon. Dentists have the same privileges as their "attending"

medical colleagues, and attend medical staff meetings, discuss cases and hospital policies, and have the right to vote and hold office.

Although the clinic was established primarily to care for polio patients, all other inpatients in the physical rehabilitation department receive dental service as the need arises.

Internal medicine—its problems in dental hospital service

Leslie M. FitzGerald. *Illinois D.J.* 25:283-287
May 1956

The 300 per cent increase in graduate and postgraduate dental education in the past ten years is reflected, in part, in advanced teaching programs of general hospitals for dental interns and residents. These approved training programs are offered in 161 general hospitals with positions for 326 dental interns and 140 dental residents. This implies a recognition of dentistry as an essential member of the health team properly concerned with the total well-being of the patient. Paralleling the hospital teaching program has been a concern with the operation of dental services in hospitals. Today, of the 1,965 general hospitals that have dental services, only 418 have been approved.

Until recently, only physicians and their auxiliary personnel were concerned with hospital practices. Dentists, as newcomers, face special problems in the hospital.

There is a growing recognition that the fragmentation of the health profession unhappily leads only to the fragmentation of the patient. The most effective care is given not by the general surgeon or the oral surgeon but by all members of the health team.

A medical history of an oral surgery patient is an essential routine, especially in the dental treatment of patients with a history of rheumatic fever, rheumatic heart disease or congenital heart defects. The threat of fatal subacute bacterial endocarditis is real, and the removal of teeth, subgingival curettage, or even routine dental hygiene procedures carry imminent danger from bacteremia. Prior treatment with penicillin or other antibiotics is vital to safeguard such patients.

A chart of preventive guards against bacterial endocarditis, a valuable tool for the dentist, is available from the American Heart Association, 44 East 23rd Street, New York 10.

A challenge for dentistry is the field of chronic illness; the hospital or other type of domiciliary institution is the place to solve the problem. There is a vast need to develop dental programs in hospitals housing the chronically ill. There is need for dental treatment for children with spastic ailments, for mental patients, and for the aged.

Dentistry must not forget that it remains a profession only so long as all of its resources are dedicated to the service of the individual patient. Dentistry must continue its cooperative relations with medicine, public health, nursing and hospital administration. When these professions work together, they can serve human beings properly.

The dentist and the hospital relationship

Editorial. *J.Canad.D.A.* 22:301-302 May 1956

The undergraduate dental student in Canada devotes about 896 hours to the study of six basic science subjects—anatomy, histology, pharmacology, chemistry, biochemistry and physiology. He also studies surgery, medicine, oral anatomy, dental pathology and bacteriology, dental radiology, oral surgery and anesthesia.

It is paradoxical that obstacles should be placed in the path of the dental practitioner when he attempts to render essential services in hospitals. Under Hospital Acts in the various provinces of Canada, the dentist has no legal status to admit, discharge, prescribe for or treat hospital patients. Enlightened physicians view these regulations with bewilderment.

Although the Hospital Acts make illegal those dental operations or services performed in a hospital, the various provincial Dental Acts make such services and operations legal when performed in the dentist's office.

It is reasonable that any patient admitted to a hospital should receive a general physical examination by a physician. The treatment and care

of dental patients, however, should be rendered by a dentist and such services should be his complete responsibility. There should be close cooperation between the dentist and physician, but this relationship should not extend to the point where the dentist is unable to perform any dental service for which he alone is responsible. If outdated legislation is not altered to permit a dentist to perform in a hospital those services to which he is academically and legally entitled in his own office, the public may be denied dental services in hospitals.

Dental care for the mentally ill

Herbert W. Mason. *Bul.Indiana Board of Health* 58:8-9 July 1956

Dental care for Indiana's 18,000 mental patients is being improved steadily. Full-time dental service is being established at all ten mental hospitals; formerly, six had either only part-time dentists or none at all. Modern dental equipment, adequate supplies and proper working space are being provided at all ten institutions. Every patient has received a good toothbrush and has been instructed in its proper use.

Mouth care is of special importance in a mental institution, because many patients are suffering from oral abscesses resulting from falls or other injuries and neglect.

Until recently, no dental attention was being provided patients at the Epileptic Village at New Castle and Richmond State Hospital, although 40 per cent of the patients are 18 years of age or less. Dental facilities are being set up in each of the three colonies of the village. Ten dentists were recruited and eight assistants were trained to examine about 700 patients and begin dental care at the village.

Because of the attention being given by the dental profession in Indiana's program to improve institutional dentistry, there are more applications for dental positions than there are jobs.

Establishment of a state dental directorship, and of dental internships for the major state institution hospitals, have been recommended.

Prosthetic dentistry



Partial dentures

A critical comparison between customary metal clasps and acrylic retainers

(A fémkapcsos és a retencios elhorgonyzás
összehasonlító kritikája)

Imre Kemény. *Fogorv.szemle* 49:48-53 Feb. 1956

A completely satisfactory technic for constructing retainers for removable partial dentures still has not been developed. Retainers should secure the

dentures against pulling, pushing and rotatory forces during mastication without damaging the abutment teeth. Retainers, as part of the dentures, also have to conform to esthetic demands. None of those requirements are fulfilled by customary metal clasps or other metal retainers such as resilient stress-breakers or slip joints. The main defect of such attachments seems to be that all movements of the denture are checked only by the abutment teeth.

To check this unfavorable stress and to release the abutment teeth from constant strain, the vestibular surface of the buccal shelf region also should be utilized. This technic, called "dentoalveolar" anchorage, is used in the construction of "retaining" prostheses. The flanges of the denture (from 4 to 5 mm. wide and 2 mm. thick) cover the buccal shelf region to the abutment teeth. From this point, an acrylic retainer follows



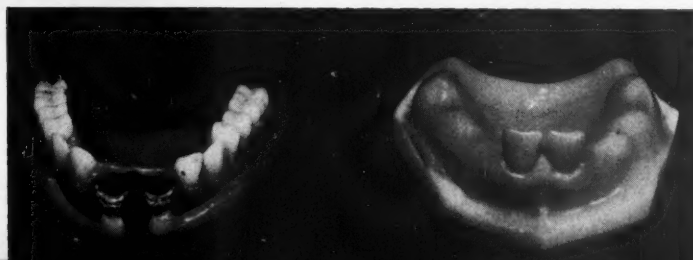
Figure 1 Dentoalveolar anchorage used in restoration of six anterior teeth and one lateral tooth; acrylic retainers are attached to the second molar

Figure 2 Restoration of lower central incisors by a retaining prosthesis



Figure 3 Unilateral free-end extension partial denture with acrylic retainers

Figure 4 Upper bilateral free-end extension partial denture



the direction of the long axis of the abutment teeth and is attached to the narrowest part of the tooth necks. The acrylic retainer is divided into a dental arm and an alveolar arm. In construction of the dental arm or of the whole retainer, transparent acrylic material should be used.

By its position and extension, the alveolar arm checks all lateral movements of the denture and relieves periodontal and alveolar tissues from the damaging effect of stress. The dental arm, attached to the necks of the abutment teeth, secures the denture against pulling forces without damaging the tissues. The mechanical accomplishments and the esthetic values of the dentoalveolar anchorage permit the utilization of all upper and lower incisors as abutment teeth.

In instances in which the buccal or the labial surface of an abutment tooth is not sufficiently convex, a crown should be constructed or an inlay inserted.

A perfectly fitting acrylic retainer requires an alveolar arm corresponding in length to its 2 mm. thickness. It is recommended that immediately adjacent teeth should not be used, but the next or the third tooth should be utilized as abutment for the retainer. A comparatively long alveolar arm is required to insure the ability to spring out from the undercuts and to secure an effective retention. The longer the alveolar arm, the more limited are the lateral movements and the harmful horizontal forces exerted on the abutment teeth.

For dentoalveolar anchorage, teeth with degenerative changes in the periodontium occasionally can be used as abutments. To avoid injuring the palate, the gingival part of the alveolar arm should be highly polished.

The technic of restoring anterior tooth gaps by fixed bridges has been practiced less since acrylic retainers for removable partial dentures have been introduced. Missing anterior or lateral teeth now can be restored by unilateral free-end extension types of partial dentures.

Clinical experience of more than six years at the Dental Institute of the University of Budapest, Hungary, has established that the dentoalveolar anchorage with an acrylic retainer is more effective than the customary metal clasps from both the mechanical and the esthetic point of view.

▼ Crown and bridge

Original cavity in lower cuspids for abutment of fixed bridgework

(Cavidade original em caninos inferiores para suporte de pontes fixas)

R. G. de Freitas. *Rev. A. Paul. Cir. Dent.*

9:33-43 Jan.-Dec. 1955

The new type of cavity preparation in the lower cuspids for the abutment of fixed bridgework of lower anterior teeth is a conjoint cavity preparation which is prepared in accordance with the general principles that govern the preparation of any cavity of this type. The technic is as follows: (1) grinding of the proximal surfaces of the cuspid, (2) grinding of the lingual surface of the cuspid up to the cingulum, (3) preparation of a linguocervical step, (4) grinding of the incisal edge of the cuspid and (5) preparation of two cylindrical proximal pits.

Grinding of the proximal surfaces is done by means of disks having only one cutting surface. The disk is placed in contact with the surface to be ground, parallel to the long axis of the cuspid and at an acute angle with the lingual surface of the cuspid. By placing the cutting surface of the disk in this position, injury to the enamel of the adjacent tooth is prevented and the contour of the labial surface of the cuspid is not injured during grinding.

A no. 306 carborundum wheel or a diamond wheel is used to grind the lingual surface of the cuspid. A linguocervical step is prepared under the lower line of the middle third of the lingual surface with no. 957 and 959 burs.

The incisal edge is ground in two opposite planes: toward the lingual surface with a no. 301 carborundum wheel or a diamond wheel at an angle of about 45 degrees and toward the labial surface only in a moderate degree. Burs no. 701 and 702 are used to prepare two proximal cylindrical pits in the dentin from the cervical third of the lingual surface to the lower end of the proximal surfaces. The pits are parallel to each other and to the long axis of the cuspid. This di-

rection is given to the proximal pits to avoid reaching the pulp chamber and injuring the pulp during their preparation.

The lumen should be rather narrow so that the inlay will almost have to be forced in. The anatomic relations of the substructures of the crowns of the cuspid are those previously described by Bronner. The features of the cavity insure retention. The inlay is introduced almost by force into the cavity and it produces frictional resistance and flexible distention of the dentinal walls which respond to masticatory stress with reactions that counterbalance displacing forces. Parallel reactions of the walls of the proximal pits also insure retention. Occlusal vertical stress, as a rule, produces horizontal forces which may cause lingual displacement or either mesiolingual or distolingual rotation of the inlay.

The points of resistance in the cavity and the mechanism by which counterbalancing forces are produced are illustrated. For forces applied to the incisal edge, the distolingual or mesiolingual borders and the mesial portion of the incisal surface of the cuspids, the points of resistance are as follows:

1. The axial walls of the cavity which correspond to the cylinders of the opposed proximal pit and to the pit under the trajectory of displacing force oppose lingual displacement of the inlay.
2. Mesiolingual rotation is opposed by forces from the inclined portion of the mesiolabial wall and the corresponding wall of the metallic segment in the opposite pit against mesiolingual rotation of the inlay. (In a similar manner distolingual rotation is opposed by the distolabial wall.)
3. The distal cylinder between arches works against mesial displacement. The two-planed incisal surfaces provide coadjutant resistance with the mesiolabial and distolabial surfaces against mesiolingual and distolingual rotation of the inlay. The depth of the proximal pits is proportional to the extension of the belt of dentin in the cervico-incisal region. The larger the arm of the cylinder within the dentin, the greater is the resistance of the cavity.



Miscellaneous

A simplified procedure for fabricating a temporary removable acrylic bite plate

David C. Stahl. *J. Periodont.* 27:118-119
April 1956

Bite plates are used as temporary splints in bruxism, to minimize the adverse effects of tongue habits and for other purposes.

A utilitarian bite plate is described that is esthetic and that can be prepared easily. Only a single impression of either the upper or lower dentition is needed. The bite plate can be prepared in a single laboratory procedure.

The bite plate for bruxism normally is made to fit the upper dentition, with the lower teeth interdigitating on the exposed surface of the plate. An alginate impression of the upper jaw is poured in hard stone. Deep undercut regions on the model are filled with asbestos clay modeling compound. The model is painted with a separating solution to facilitate removal of the finished bite plate.

The model is placed on a pedestal beneath a hydraulic press, and a sheet of one-eighth inch acrylic resin is positioned on the model. An inverted heating element is held one inch above the acrylic resin to warm it until it softens and begins to fold easily around the model. The softened material is pressed with a blunt instrument into the vault region, and pressure is applied with the press. The acrylic resin cools within two or three minutes, and is then permanently swaged to the outline of the model and trimmed. Only minimal finishing is necessary. The appliance is inserted at the patient's next visit. Little adjustment is normally required. For maximum stability the palatal vault may be left covered, although horseshoe designs have proven stable and somewhat more comfortable.

Orthodontics and pedodontics



Pedodontics

A simple space maintainer for the primary dentition

Odd Reidar Sannerud, Oslo, Norway.
J.Den. Children 22:175-179 Oct. 1955

Premature loss of deciduous teeth is one of the factors causing malocclusion in the permanent dentition. A simple procedure has been developed to maintain space in such instances. The new space maintainer is based on a ligature technic with the application of stainless steel wires into the healthy gingival pockets of the teeth adjacent to the extracted tooth.

The space is kept open by means of a coil spring made of 0.25 mm. hard stainless steel wire. This wire is coiled on a 0.7 to 0.9 mm. wire. When the coil spring is the proper length, it is fixed to the abutment teeth with 0.25 mm. soft stainless steel wire which passes through the coil. The wire is tightened, and with a thin instrument it is pressed down to the bottom of the pocket. It should not be movable in relation to the tooth.

When the space maintainer has been placed properly, the twisted ends of the wire are cut at a distance of about 2 mm. from the tooth. Finally, the wire is pressed completely into the gingival pocket, leaving only the twisted ends of the ligature wire protruding; these may be turned apically and be completely embedded in the soft tissue. The coil spring should be adjusted so that it may not cause the permanent tooth to deviate when erupting. The space maintainer can be used for any tooth within the deciduous dentition.

To increase the space between two teeth, a space "regainer" is proposed. A soft stainless steel wire (0.25 mm.) is placed around the posterior

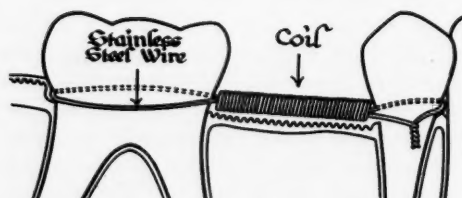


Figure 1 Space maintainer with abutment teeth on both sides

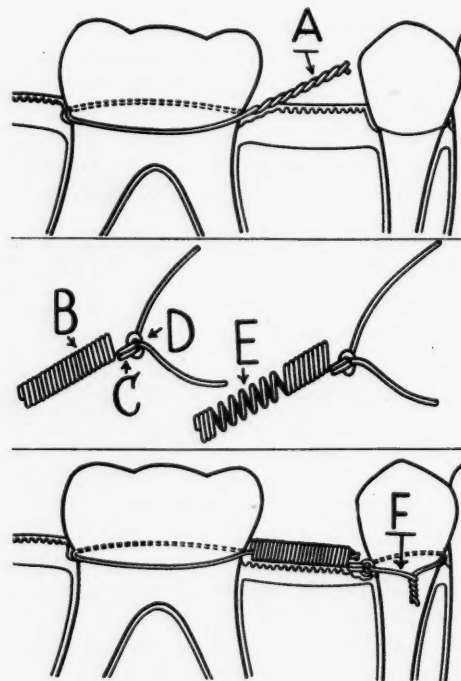


Figure 2 Space "regainer." A stainless steel wire is placed around and at the bottom of the gingival pocket of the posterior tooth. The ends are twisted and cut to reach the distal surface of the anterior tooth (A). A coil of the same length as the interdental space is applied over this string (B). Two turns of the coil are bent 90 degrees to form a loop (C) through which a soft steel wire is fastened (D). The coiled tube is activated to form a coil spring (E). The activated (elongated) coil spring is attached to anterior tooth as in (F)

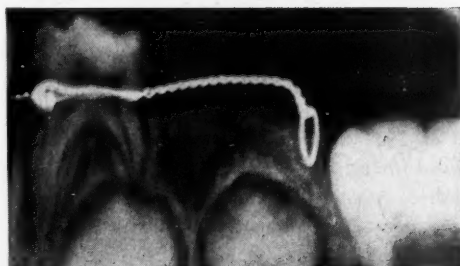
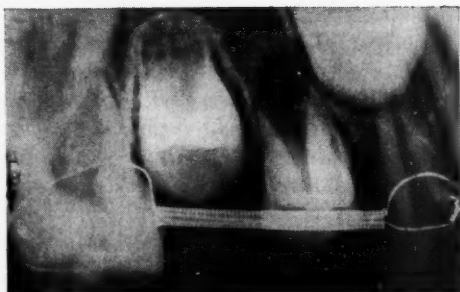


Figure 3 Above: Space maintainer with upper deciduous cuspid and upper first permanent molar as abutment teeth. Center: Space maintainer with upper deciduous cuspid and second molar as abutment teeth. Below: Space maintainer for an unerupted first permanent molar

tooth and tightened in such a way that it slides into the pocket. The ends should be twisted, the twisted portion of the wire corresponding to the width of the space. The twisted ends are left to extend out of the pocket at the center of the mesial surface. A coil spring made of hard stainless steel wire of a length corresponding to the interdental space is placed on this twisted string. The two last turns of the spring are bent 90 degrees to form a loop. To this loop a soft stainless steel wire (0.25 mm.) is tied with a regular knot and placed

at the bottom of the pocket of the anterior tooth, where it is tightened.

The coil spring is the actual space regainer. It is activated to the desired extent by being stretched before insertion. It will work like a spring to increase the space between the teeth.

These simple devices have been used for five years in 972 instances. Clinical observations show that the soft tissue heals completely around the wires. Signs of inflammation are seldom seen. The children tolerate the appliances well, and never complain of discomfort. In no instance were there any complications or premature shedding of the deciduous teeth. The average time needed to construct the space maintainer is 15 minutes. A little more time is required to insert the space "regainer."

The major advantage of the appliances lies in the extremely short time needed for their construction. This opens the possibility of providing space maintenance in all instances of premature loss of deciduous teeth.

Public relations and the child patient

Charles E. Oxar. *J. Florida D. Soc.* 26:10-11 Jan. 1956

Data have been derived from an examination of 1,972 children seen over a five year period by the pedodontist. The patients consisted of 1,014 boys (51 per cent) and 958 girls (49 per cent).

Most of the patients (1,748, or 88.6 per cent) who visited the dentist for the first time were brought in for a routine dental examination. The percentage of emergency patients was 11.1; some of these were treated for fractured teeth, but most had pulpitis or abscesses.

A total of 113 patients, or 14.5 per cent, were brought in for the first examination at four years of age; 98 patients, or 12.7 per cent, were brought in at the age of five; the third largest group (88, or 11.4 per cent) was brought in at the age of six. The youngest patient was ten months old, and the oldest, 14 years.

Few children had clean mouths. Only 502 patients (25.5 per cent) had no debris; 1,468 patients (74.4 per cent) had debris varying from slight to a great deal.

There were 322 patients (16.32 per cent) with stained teeth, and, usually, large amounts of debris accompanied the stained teeth. Green stain was the most frequent; it was observed in 247 patients, or 12.5 per cent of all patients. This stain is found predominantly in the upper anterior surfaces, but is seldom found on the lingual surfaces of either arch. Forty-one patients had orange stain, which is found only on the posterior teeth, and most frequently on the lower posterior teeth. Eighteen patients had black stain, which is found usually on the buccal surfaces of the lower posterior teeth.

Of the 1,972 patients, 368, or 18.66 per cent, chewed their fingernails, and 30, or 1.52 per cent, chewed their toenails; 94 patients (4.77 per cent) sucked fingers or thumbs, and one sucked his toes. There were 14 instances of chronic bruxism.



Growth and development

A review of the significant findings in growth and development since the advent of cephalometrics

Robert R. McGonagle. *Angle Orthodont.*
26:155-165 July 1956

It is through the cephalometer, a precision instrument introduced in 1931 by B. Holly Broadbent, that the complex field of dentofacial development has been explored. It is from a serial study of the standardized roentgenograms, made possible by the cephalometer, that many of the basic concepts of orthodontic thinking have evolved.

In 1937 Broadbent published the first comprehensive report of the findings of the Bolton study, an investigation of the heads of healthy boys and girls. The most striking revelation was that when representative composites of various stages in the growth and development of the face were compared, an orderly and progressive pattern was apparent. This contradicted the previous studies made from the skulls of children which described growth as a series of "stops" and "goes" without continuity of the process.

The Bolton study revealed certain sex differences, in that the supraorbital ridges and the external occipital protuberance were more prominent in the male than in the female. Broadbent noted that the posterior nasal spine moved straight downward with growth, and that the palate maintained a parallel relationship during the growth span.

Broadbent sought to extend the usefulness of the cephalometer to clinical problems. He held that early defects and deviations in facial growth which led to later abnormalities in the denture could be detected and documented for future comparison. This was a radical departure from the belief that occlusion could alter the facial conformation rather than the other way around.

Brodie, Downs, Goldstein and Myer in their 1938 study, "A Cephalometric Evaluation of Orthodontic Results," found a definite correlation between success in orthodontic treatment and good facial growth. They also found that bone changes accompanying orthodontic treatment seemed to be restricted to the alveolar bone.

Baker (1941) observed that experimental interference in the denture regions induced changes in relatively remote facial areas.

In 1941 Brodie's thesis on the growth of the head from three months to eight years was published. Among its findings were the following: The morphogenetic pattern of the head is established by the third month of postnatal life, or perhaps earlier; once attained, it does not change; the face does not change its axis in relation to the cranial base, and growth is an orderly progression without "stops" and "spurts." Brodie's achievement was his systematic and imaginative approach to the study of growth and development, and his ability to relate laboratory findings to the daily problems of orthodontics.

Bjork accepted Brodie's pattern concept in principle, but did not subscribe to the rigid fixation of proportions. His studies (1947) showed that the facial axis changes its relationship to the cranial base, and that facial prognathism increases with age. Lande's work (1952) supports Bjork's contention that the mandible becomes more prognathic with advancing age; this increase is associated with a decrease in the angulation of the lower border as well as a decrease in the angle of convexity.

In 1951 Brodie presented his findings on late growth changes. It was becoming apparent to many that individual variation was the only finding that remained constant. Brodie found that the facial planes began to show changes in relationships, that the denture did not move forward as rapidly as the supporting facial bones and that great fluctuation existed in the angulation of the incisor teeth during growth.

Bjork postulated that facial prognathism increased because mandibular growth was more active than growth of the cranial base.

Thompson concluded that physiologic rest position is highly constant and cannot be altered permanently by prosthetics, operative dentistry or orthodontic procedures. Ricketts, in a lamina-graphic study, found that rest position was not immutable but was subject to change with alteration in anatomic relations induced by orthodontic therapy. He reasoned that physiologic rest position is a conditioned position in the interest of speech and mastication, and not conditioned by posture alone.

Intensive studies now underway in the field of muscle physiology undoubtedly will uncover important knowledge in unexplored areas.

The bibliography lists 52 references.

The mechanism of adjustment to wear and accident in the dentition and periodontium

Alton Wallace Moore. *Angle Orthodont.* 26:50-57 Jan. 1956

All forms of life must have some mechanism of adjustment to wear and accident, for without such a mechanism it would be impossible to prolong life for any long period of time. It is not easy to analyze the repair mechanism of the teeth.

Teeth may be classified according to their various mechanisms of adjustment. There is a perpetual succession of teeth in the fish, reptile and in certain mammals such as the elephant; as a tooth is lost, a new one takes its place. In some species teeth are continually growing, such as the rodent's incisors and the elephant's tusks. In other species teeth are continually erupting throughout life. The dentition of the ungulates possesses this

characteristic. Teeth of limited growth and eruption are possessed by the modern carnivores and omnivores. Man falls in this latter category.

When these four machines of adjustment are analyzed, it is obvious that under normal environmental conditions these mechanisms maintain a relatively constant mandibular relationship to the cranium during growth of the particular species.

The various mechanisms of adjustment that are inherent within the denture are evaluated by analyzing its component parts.

Black pointed out that under natural conditions there is wear of the interproximal surfaces of all contacting teeth. He concluded that the amount of wear in the entire denture during a lifetime was almost equal to the width of a bicuspid in a vigorous masticator. As this wear takes place, the mesial force created by function is the mechanism of adjustment that maintains the denture intact.

The buccinator and superior constrictor muscles comprise an elastic force surrounding the entire denture, and are responsible for molding the maxillary denture against the lower contained mandibular arch.

The functional forces of occlusion create a buccal and labial force on the maxillary denture and a lingual force on the mandibular denture. The mandibular arch form is determined primarily by the lingual forces created by function. The contact of the mandibular teeth with one another produces a contained arch around which the buccinator muscle and the incline plane relationship of the teeth mold the maxillary denture.

The normal human dentition has an adequate mechanism for adjustment to wear and accident, providing abnormal forces are not created to disturb the state of balance that exists between the denture and its associated structures.

Mouth breathing

E. Gwynne-Evans. *M.Press* 235:246-249 March 21, 1956

An infant breathes through the nasal passages because normally there is no alternative route. The tidal air of the infant is small; the respiratory rate is high and the rhythm of breathing is not influenced by will. A free and unimpeded airway

independent of the mouth is vital, so that breathing may continue with as little influence as possible throughout the suckling process.

As the infant develops into a small child, important structural changes take place in the head and neck, including the apparent lengthening of the neck and the growth of the lower two thirds of the face.

An open mouth is not indicative of mouth breathing. Mouth breathing can only occur if, in addition to the open mouth or parted lips, the soft palate is elevated from the tongue or the tongue lies away from the soft palate. Facial appearances are deceptive and count for little in the diagnosis of mouth breathing. The best way to test for mouth breathing is to hold in front of the child a cold, polished metal spatula so that condensation of breath can be obtained. This method will furnish visible proof.

An open mouth is part of many normal children's facies at rest. It is not that such a child cannot keep his lips closed at will, but that when he is at rest his jaw and facial muscles relax passively to a position which must be considered as a normal position for him at his age.

As the child grows, the progress of thought constantly directs his attention to his facial muscles, and a closed-lip habit usually results during the normal processes of education, regardless of exercises or other measures that may have been taken in early life to achieve lip closure.

Muscle exercises and various measures to increase muscle tone in the early years of life are usually a waste of time. Once a certain stage of maturation is reached and the child begins to take note of his facial appearance and to become more socially minded, he will respond to any help given him. Such children will help themselves to achieve a closed mouth and lip habit in their own time, regardless of what is done to encourage them.

The value of the acrylic oral screen or the Norwegian monobloc to counteract mouth breathing and encourage lip closure is doubtful.

It is more important to recognize and alleviate nasal obstruction than to worry about persistent oronasal breathing, or to submit the child unnecessarily to tedious lip exercises, or to the discomfort of dental appliances, or to the injustice of constant admonitions at home.

Orthodontics

Hereditary deep overbite

(Naše izkušnje pri zdravljenju pokritega griza)

Jože Rant. *Zobozdrav.vest.* 11:1-4 Jan.-Feb. 1956

The excessive overlapping of the upper and lower incisors is a hereditary condition which may be present in the first three classes of malocclusion. This condition is detrimental to therapy and prognosis.

Orthodontic treatment of deep overbite, especially if accompanied by distoclusion, is difficult because of the unfavorable influence of the upper lip which usually shows spasmodic, involuntary movements and distortions. Such a condition of the upper lip interferes with the movement of upper incisors, especially during the time when the patient does not wear an orthodontic apparatus.

In instances of extremely deep overbite, the alveolar bone is hard, often sclerotic, and offers great resistance to all tooth movements. When this condition is treated with Andresen-Häupl's monobloc technic, one or two retention wire splints are constructed and inserted from the distal proximal surface of the left lateral incisor and are connected with the right lateral incisor of the upper jaw.

The problem of extremely deep overbite always is a source of anxiety to the orthodontist because his responsibility does not end when correction by proper vertical growth is obtained. A continued observation of the weak and susceptible alveolar tissues is necessary. These structures are associated with the defect.

The many detrimental factors necessitate a prolonged use of the orthodontic appliances, and the patient should be advised to wear the apparatus day and night for at least one full year, and after this period for two or three nights every week, until the posterior teeth are elevated to such an extent that the incisors present an open bite of at least $\frac{1}{8}$ of an inch.

Thumbsucking and breathing (Lutschen und Atmung)

Hans Brückl and Dieter Melzer.
Fortschr.Kieferorthop. 16:88-95, 1955

Thumbsucking and mouth breathing are common and important clinical problems. It has been estimated that more than 90 per cent of all infants insert the whole thumb deep into the oral cavity every day, and that 85 per cent of all children suffer from nasal insufficiency to some degree. Twenty per cent breathe through the mouth habitually.

Every individual has his characteristic habits. Some are desirable because they conserve time and energy, but others are damaging and upset normal function or tend to develop deformities.

Thumbsucking and mouth breathing can deform the jaws. It often has been assumed that thumbsucking children are nose breathers because they press the lips firmly on the thumb and are forced to breathe through the nose. Examinations undertaken at the Orthodontic Institute of the Humboldt University of Berlin, however, did not verify this theory. These examinations reveal that most of the thumbsucking children sleep with their mouths wide open. When the thumb is taken from the mouth, the children instinctively open the lips.

In thumbsucking, the introduction of extraneous forces disturbs normal function and the esthetic configuration of the dental arches.

Habitual mouth breathing often occurs at night, and many patients are unaware of this habit. Various authors have emphasized different aspects of mouth breathing. All agree, however, that this habit is detrimental to dental health.

Roentgenograms reveal that thumbsucking children often are habitual mouth breathers. In nose breathing, the tongue touches the hard and

soft palate; in mouth breathing, the tip of the tongue touches the lingual side of the lower anterior teeth and does not touch the palate. Habitual mouth breathing can be partial or complete, continuous or intermittent. In all these instances, the functional adequacy of the nasal passage should be tested rather than estimated.

Thumbsucking in infants is not of immediate concern to dentists, especially in instances in which no physical defect is produced in jaws or teeth. In the period of infancy, the pediatrician should be concerned with the thumbsucking. In this period, and also later, this habit helps to interpret the child's desires and sensations. Thumbsucking can be an expression of insecurity and a sign of unhappiness.

After the period of infancy, thumbsucking children may become habitual mouth breathers because of a hypertrophy of adenoid tissues, and nose breathers during the thumbsucking action only.

Serial examinations reveal that 50 per cent of thumbsucking children are mouth breathers because of adenoid disturbances, and 13 per cent by habit.

Not only the orthodontic or the psychological aspects should be considered but the rhinological standpoint. When adenoids are the causative factor of mouth breathing, adenoidectomy should bring relief. When habitual mouth breathing is present, orthodontic (functional) treatment should obtain a change to nose breathing.

Thumbsucking is responsible for many occlusal deformities by acting as the predisposing factor for a tongue-thrusting habit. Such deformities in time become unesthetic and frequently require extensive orthodontic treatment. The psychic damage caused by open bite and other oral deformities is inestimable. Breaking of the thumbsucking habit, however, eliminates but one of the two causes for anomalies of the jaws.

Armamentarium

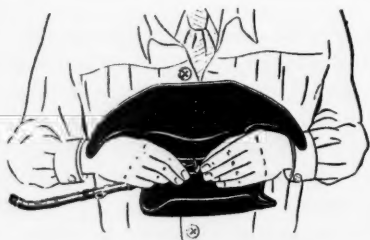


Equipment

Gold dust collecting bowl (Goldstaub-Fangschale)

A. Baumann and E. Huber. *Dent.Echo* 26:57
March 1956

A gold dust collecting bowl, recently invented and introduced, saves valuable particles of gold or other precious material which otherwise would



be lost during the preparation of bars, bridges, clasps, crowns, inlays and partial or complete dentures.

The advantages of the appliance are as follows: (1) the dentist's hands remain free for his work; (2) the bowl can be attached easily to the dentist's chest by a slight pressure of his wrist, and stays in position even when instruments have to be changed; (3) the bowl functions without assistance; (4) the dentist's clothes remain clean, and (5) dropped parts are caught in the collecting bowl and can be found easily.

A specially constructed brush made of the finest hair, to separate the gold particles from useless splinters, is given to the buyer as a gratuity.



Materials

Use of epoxy resins in restorative materials

R. L. Bowen. *J.D.Res.* 35:360-369 June 1956

One of the relatively new synthetic resins now commercially available is epoxy resin, a completely different type of resin than the methacrylate resin now being used in dentistry. The epoxy resins will cure at room temperature to produce a strong, chemically stable, thermoset solid with outstanding adhesion.

An epoxy resin was used as a binder for fine particles of silicon dioxide and porcelain. With this mixture the following properties may be obtained in a dental filling material: (1) thermal expansion equal to that of tooth structure, or 11 ppm per degree centigrade linear; (2) adhesive properties; (3) color stability, and (4) apparent stability and insolubility in the oral environment.

Further investigation and development of this approach to dental restoration materials are indicated.

Titanium, a new and versatile dental material (Titan, ein neuer, vielseitiger Werkstoff)

H. van Kann. *Umschau* 56:356-358 June 15, 1956

For a long time, a gap has existed between the light metal aluminum and the heavy metal steel for industrial and dental purposes. Recently, with the discovery of titanium and the development of useful titanium alloys, this gap has been filled.

Titanium, a metallic element, belongs to the fourth subgroup of the periodic table. Its chemical symbol is Ti, its atomic number 22, and its atomic weight 47.90.

Five stable titanium isotopes of mass numbers 46, 47, 48, 49 and 50 were identified in the second half of the twentieth century, and radioactive titanium isotopes with mass numbers 45 and 51 were isolated.

Titanium was first recognized in its compound form by William Gregor (1789) who called this

black material "menachite" or "meccanite." A few years later, the German chemist M. H. Klaproth recognized a new element, and because of the stability of its chemical compounds, he called it "titanium"—after the Titans of Greek mythology, the incarnation of strength.

Food acids exhibit no corrosive action on titanium or titanium-coated iron. The low thermal conductivity of titanium has suggested a possible use as a material for dental and medical instruments, orthodontic and x-ray apparatus, and for its alloys as prosthetic dental materials.

Even with the uniquely desirable properties of titanium and its alloys, and the recent advances made in its production, titanium still is too expensive to be able to compete with stainless steel, aluminum or copper for purposes in which these less expensive metals function satisfactorily.

With further advances in production and chemical research, however, titanium seems to be the dental material of the future.

Studies on the penetration of mercury through the dental hard tissues, using Hg²⁰³ in silver amalgam fillings

Karl O. Frykholm and Erik Odeblad. *Acta odont. scandinav.* 13:157-165 Nov. 1955

Radioactive mercury with a half-life of 45 days was obtained by neutron bombardment of mercury metal in an atomic pile (A.E.R.E., Harwell, England). This mercury was mixed with equal parts "silver" alloy "68" and the mix was used to fill human tooth cavities *in vitro*, and in two instances, *in vivo*, and 40 tooth cavities in two monkeys and 12 cavities in a dog's teeth. The penetration of mercury was studied by apposition autoradiography, Geiger-Müller countings and scintillation counting.

Secondary and scattered radiation as well as dust contamination are sources of error in autoradiography. The sensitivity of this test is such that the presence of a few hundred micrograms of mercury per milligram of pulp tissue may be revealed, but contamination by radioactive particles, accidentally introduced as dust from the cutting and grinding operation resulted in diffuse exposure of the whole pulp region of

the film thus making quantitative interpretation questionable.

Geiger-Müller counting with a TCG-2 tube on dried squash preparations of dental pulp tissue extracted from the lingual side of dog teeth with buccal fillings showed the presence of some tenths of micrograms of mercury in whole pulps ten days after the placing of radioactive amalgam fillings. Scintillation counting with a Tracerlab P 20 detector was carried out on dried samples of spleen, heart, liver, kidney and brain of the dog. No mercury was revealed in any of the organs examined.



Therapeutics

Council [on Dental Therapeutics] reports on topical dosage forms of penicillin

J.A.D.A. 53:66-67 July 1956

The Council on Dental Therapeutics of the American Dental Association continues to regard penicillin as the antibiotic of choice for the control of the bacterial factors in oral infections. The effects of penicillin may be obtained by systemic administration, more particularly in deep-seated infections, but also in superficial infections of the oral tissues. The Council believes that, where the use of penicillin is indicated, satisfactory results are obtained through the use of systemic dosage forms.

For some time, the Council has accepted for listing in *Accepted Dental Remedies* topical dosage forms of penicillin for the treatment of infected superficial tissues or postextraction sockets. Recently it has become increasingly evident that serious results may ensue after exposure to penicillin in individuals who have been sensitized through previous contact with the drug. Since the ability to employ penicillin for systemic effect is of extreme importance in the prophylaxis and treatment of serious infections, the Council regards the hazard of sensitization as one of sufficient magnitude to justify the recommendation

that the use of topical dosage forms of penicillin in dentistry should be discontinued. The Council therefore has classified penicillin troches, lozenges, ointments, pastes, topical powders and dental cones in Group D; brands of these dosage forms will be deleted from future editions of *Accepted Dental Remedies*. The Council is reviewing preparations containing other antibiotics the use of which is restricted to local application.

Re-examination of Huneke's time phenomenon by double blind tests

(Überprüfung des Sekunden-Phänomens nach F. Huneke im doppelten Blindversuch)

R. Ebner and H. Ley. *München.med.Wschr.* 98:298-303 March 2, 1956

Recently, the staff of the medical clinic of the University of Munich, Germany, re-examined the time phenomenon which was observed and reported first by F. Huneke in 1928.

This re-examination revealed that dental focal infections can be influenced, improved and cured through elimination of the site of disturbance by continued local injections of procaine hydrochloride. This site of disturbance in instances of dental granuloma, severe cicatrization in the oral cavity or chronic tonsillitis, evokes and preserves focal infection. The rapid interruption of the symptoms within seconds by injection of procaine hydrochloride is termed "time phenomenon" and reveals whether neural disturbances or focal infection are the causative factors. By his term "phenomenon of seconds," Huneke meant not only the interruption of pain within measurable seconds but also the immediate beginning of definite improvement or cure.

During the re-examination of Huneke's theories, 225 injections were administered to 91 pa-

tients in double blind tests. Neither the physician nor the patient knew whether the solution injected contained the drug or a placebo.

One group consisted of patients with dental diseases probably caused by focal infection; another group was formed of patients showing similar symptoms but which obviously were caused by other diseases, mainly cancer.

Huneke had set up a series of criteria concerning his time phenomenon, such as abating of pain for several hours immediately after injection, reproducing certain of the effects, gradual lengthening of the periods without pain, and finally cure of the basic disease within existing anatomic limitations.

The time phenomenon was encountered during the double blind tests in three patients, two of them suffering from dental granulomas without inflammation. The third patient had pain in the region of the temporomandibular joint without local or general pathognomonic alterations being present.

The pain was alleviated immediately after local injection of procaine hydrochloride into the site suspected of being the center of the focal infection.

Freedom from pain which lasted for several hours after injection was observed 25 times in 11 patients. Among those patients were two men afflicted with malignant tumors.

The significance of a "pragmatic" and a "magic" cure (Jores), and the importance of a strict differentiation between both healing procedures must be emphasized. Indiscriminate use of procaine hydrochloride injections without a precise indication merely to obtain or to study the time phenomenon can lead to severe complications.

Further tests on the time phenomenon under similar conditions, especially to establish the effects of placebo injections, are recommended.

Oral surgery



Plantation

Replacement of missing teeth by implants and porcelain jacket crowns

N. Ben-Basset. *Refuat Hashinaim* 9:10-13
Dec. 1955

The implant denture no longer is a controversial subject in dental literature; its value in prosthetic dentistry has been established. Methods to be used in construction, preparation and insertion of implant dentures, however, still need further study and evaluation.

In 1936, reports on the possible utilization of Vitallium, a cobalt-chromium-molybdenum alloy of platinum-white color, appeared in medical and dental literature. Previously, Vitallium had been used successfully for surgical instruments. For the construction of implant dentures, this alloy seems to be the most suitable material because it causes no electrolytic reaction.

In 1949, Goldberg and Gershkoff reported their method for lower implant dentures in which Vitallium was utilized. In 1954, Kleinschmidt presented his description of implants for isolated teeth.

In the majority of instances, the subperiosteal implants have proved to be successful because the presence of Vitallium was "ignored" by the tissues, and the osteoblastic and osteoclastic activities went on undisturbed through the meshwork of the casts.

There are two types of small implants: (1) those used as abutments for fixed bridges, and (2) those used as abutments for isolated teeth.

The first type can be employed successfully to restore two or three teeth on each side of the jaw,



Oral condition before prosthetic rehabilitation



Implant and attachments

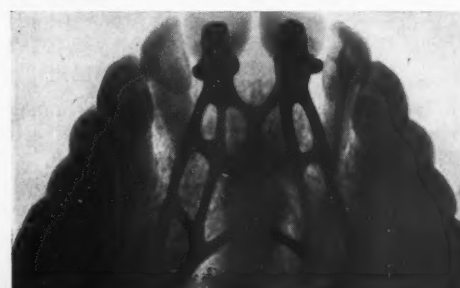


Abutments and part of implant



Oral condition after prosthetic rehabilitation

Roentgenogram taken 12 weeks after insertion of implant denture



thereby replacing partial removable dentures. A saddle-shaped implant with one pivot can be inserted in the vicinity of the last missing tooth. This implant and pivot can serve as the abutment for a fixed bridge.

The second type should be used to replace missing incisors or any isolated tooth in the region of the bicuspid. Implants for isolated teeth are constructed as lattice-shaped nets with comparatively large meshes. The area of the network, however, should never be smaller than the area of the root.

There are also two types of implant abutments: (1) the "bottle-shaped" abutment with its neck toward the base of the implant, and (2) the customary abutment which can be attached directly to the base. Thimble crowns are prepared in advance, and after the implant is inserted and secured in position, the crowns are completed on the thimbles.

In the method recommended, the implant is constructed along new principles as follows: (1) the pivot should be constructed in a manner similar to that used in the shoulder type preparation for porcelain jacket crowns, and (2) the porcelain crown is constructed on this pivot without the use of a thimble.

This combination of implant and porcelain jacket crown has the following advantages: (1) a solid, unbreakable abutment; (2) an excellent appearance; (3) no interference with the gingival margin, and (4) a better tolerance of the mucous membrane to porcelain.

In the laboratory work, two principles should be considered: (1) implant and crown must be constructed in such a manner as to avoid injuries to the incisor foramen, and (2) the size of the implant must be reduced before it comes in contact with the middle line of the palatal suture.

After the shape and size of the implant are determined, two wings on both sides of the palate are attached. After examination of the palate, the width of the mucous membrane should be established. The implant is designed and constructed on the model, and then the width of the mucosa is scraped off. When the implant is finished and placed temporarily on the model, the crowns are prepared in the customary manner and the implant covered in the final stage of the preparation for the denture.



Surgical technics

Carcinoma of the mucous membrane of the cheek and its treatment

V. A. Gremilov. *Stomat., Moscow* 6:24-28
Nov.-Dec. 1955

Ninety cases of cancer of the buccal mucous membrane, seen between 1926 and 1953, are reported. This type of cancer is two to three times more common among men than women. Although the disease occurs oftener in mature and older people, this series included patients aged 17 to 20, and patients under 40 constituted 20 per cent of the total number. The right cheek was involved in 60 per cent, the left in 40 per cent. No uniform pattern of involvement could be observed, but the mucous membrane paralleling the occlusal surfaces of the teeth was involved in 39 per cent and the posterior third of the cheek in 53 per cent. The disease in posterior regions gives rise to symptoms later, is more difficult to recognize, has a less favorable outlook, and its treatment by radical measures is far more difficult than is cancer in the anterior regions of the mouth. Clinical data confirmed that healing was nearly three times as common in the anterior part of the cheek (43 per cent) as in the posterior part (16.7 per cent). The prognosis is particularly poor if cancer of the posterior third of the cheek has invaded the adjacent oral organs.

Cancer of the buccal mucous membrane is highly malignant. At an early stage, the prognosis is unfavorable for tumors with smooth submucous infiltration. In advanced stages, the most dangerous tumors are those with ulcerous infiltration that spreads rapidly either to the surface or to a depth. In 10 patients of this series, cancer involved the entire cheek; in 18, one fourth to two thirds of the cheek, and only in 17 was the involved area limited to 3 to 10 sq. cm. In 18 patients, it had spread to, or perforated, the skin; in 17 it had infiltrated into the muscle, and in 10 it had involved other submucous tissues. Adequacy of treatment depends on the degree of

spread, but even more on the depth of involvement of underlying tissues. In 54 of the patients (65 per cent) the cancer had metastasized to regional lymph nodes; in 19 (29 per cent) such metastasis was confirmed histologically. The unilateral submaxillary lymph nodes are the first to become involved.

The gravely malignant course of this type of cancer demands early diagnosis and the institution of effective therapeutic measures. Early diagnosis is still far from satisfactory. In this series, diagnosis was established in stage 1 in 3 patients; in stage 2, in 38; in stage 3, in 38, and in stage 4, in 11. The early stages of cancer of the buccal mucous membrane produce no recognizable symptoms, and patients postpone seeking medical care. In its early stages, moreover, cancer is difficult to differentiate; in this series, for example, initial diagnoses among 55 patients who sought early medical care ranged from inflammatory disease to traumatic lesions and syphilis.

Only 5.5 per cent of the 90 patients were in good health five years after treatment. Excluding those with stage 3 and 4 tumors, which are suitable only for palliative measures, 12.2 per cent of the patients had good health five years after treatment and 48.5 per cent, after two years.

Treatment of cancer of the buccal mucous membrane consists of extirpation of the primary site and prevention and treatment of metastases to the regional lymph nodes. Of numerous treatment methods, rarely is extirpation entirely satisfactory. No method of radiation therapy, telecurietherapy included, was fully effective. Electrosurgical intervention appears to be most effective and electroexcision of scattered tumors proved to be more effective than electrocoagulation, but often caused severe scar contractures, limiting the range of oral function. Scattered tumors of the buccal mucous membrane, particularly those extending to the alveolar process, require extensive resection and electrosurgical procedures, even to the removal of the upper or lower jaw.

Combined radiation therapy and surgery is most effective when electrocoagulation or electroexcision is followed by interstitial radium therapy, particularly when the carcinoma is restricted to the anterior third of the cheek. The tumor is excised with an electrical scalpel, after which the

tumor bed is imbedded with radium needles for from three to five days or to a total dose of 6,000 to 7,000 roentgens. One of the failings of interstitial treatment appears to be that doses delivered at each session of therapy are low, requiring too long an interval before the total dose is attained.

Experience points to the need to excise lymph nodes on healing of the primary site, whether treatment is preventive or therapeutic. The sole justification for skipping this step would be the advanced age of the patient. Lymph nodes should be extirpated bilaterally, and even if the cancer is on the posterior portion of the cheek, the deep lymph nodes of the neck, unilateral to the primary lesion, should be extirpated.

▼ Surgical pathology

A rare case of neurofibromatosis Recklinghausen (plexiform type)

Erna Christensen and J. J. Pindborg.

Acta odont.scandinav. 14:1-10 June 1956

A case of neurofibromatosis Recklinghausen in a nine year old boy is reported. The boy had about 20 cafe au lait spots on the skin of the body and right side of the face, and his tongue exhibited a large diffuse swelling. There was considerable swelling of the right side of the face and neck, in the paratid and the submaxillary regions.

The mother reported that as early as the boy could raise his head by himself, an asymmetry of the face was discernible and an enlargement of the tongue was noticed.

A partial resection of the tumor masses was performed in three operations. It was noted that the tumor tissue reached into the floor of the mouth, the tongue base and extended down the neck. These regions were left untouched. The histologic examination was so characteristic that differential diagnostic considerations were almost superfluous. It revealed a heavy infiltration with neurofibrils, in a plexiform pattern, into the muscles and submaxillary gland. Proliferations of the

Schwann's cells and of the endoneurium and perineurium were seen.

The prognosis is poor. Although no histologic signs of malignancy were shown, the tumor has slowly but steadily grown from birth to the present. It has been impossible to remove the tumor completely because of its infiltrative growth in the submaxillary and submental regions. A continuous growth is probable and a malignant transformation into neurogenic fibrosarcoma is likely.



Extractions

Exodontia by alveolectomy

(Exodoncias por alveolectomía)

P. M. Vargas Salerno. *Venezuela odont.* 20:39-43 April 1956

Extraction by alveolectomy is indicated whenever the roentgenographic examination suggests that extraction of a given tooth or root by the standard procedure may cause trauma, laceration or postextraction sequelae. It is mainly indicated (1) in instances of remaining roots or when the roots are curved, ankylosed or thin and fragile; (2) in the presence of diseases of the root apices; (3) when the crowns are carious and when they have been previously used for a prosthesis and are weak, and (4) in instances of abnormalities in the position, size and number of teeth.

The operation consists of (1) incision of the gingival tissues, down to the bone, (2) preparation of a flap, (3) osteotomy and (4) extraction of the tooth or the root.

The vestibular approach is the route of choice for the incision of the gingival tissues, although in special circumstances it is best to use the palatine route. Care is taken not to injure the blood vessels, for this injury may interfere with the nutrition of the flap. The form of the incision depends on the particular type of operation to be performed. Some indications are the following: Newman's incision (incision in the form of a trapezium) for multiple extractions; the semilunar or else the horizontal straight incision for

apicectomy; Newman's modified incision, straight and curved with upper convexity, for impacted molars, and incision with curved internal concavity by the palatine approach for impacted cusps, and so forth.

The incision should include the periosteum, which should be handled and lifted with extreme care because this structure plays an important role in the re-establishment of bone. The flap is prepared with a wide base. It is lifted with an elevator and reverted by means of retractors. The operative field is dried and osteotomy performed with a chisel, surgical burs or any other adequate instrument. As soon as the external flat surface of the bone is resected, extraction of the tooth or root is attempted. In some instances the tooth or root can be extracted by the usual methods. In other instances, however, the crowns have to be separated from the roots, and the interradicular septum has to be resected. The use of extracting forceps, elevators or any other instrument to complete the extraction at this stage of the operation will be indicated by the anatomic and physiologic condition of the tooth or root to be extracted.

Immediate postoperative care includes: (1) the process of making regular and smooth the borders of the bone cavity; (2) the treatment of the surgical wound; (3) the suturing and replacing of the flap, and (4) in some instances, drainage.

The borders of the bone cavity are made even by bone chisels and bone files. Bone and dental material are eliminated from the cavity by washing it with saline solution. The flap is placed and fixed by means of a suture. Drainage is used only in rare instances in which exudates have to be removed. This is usually carried out by means of simple gauze or of a strip of a 5 per cent iodofomed gauze.

If material is left in the cavity it may delay the healing process, or it may cause other postoperative complications. In the presence of granulomas or cysts, care should be taken to remove the whole pathologic process and to paint the cavity with phenol. Even minute particles of the process left within the cavity can be the source of recurrences. Rest and surveillance of the patient during the postoperative period are important. It is advisable, therefore, to have the patient hospitalized for the operation.

Anesthesia and analgesia

Effect of hyaluronidase on swelling and trismus after removal of impacted mandibular third molar teeth

P. T. Fleuchaus. *Oral Surg., Oral Med. & Oral Path.* 9:493-500 May 1956

Swelling and trismus have been considered an inevitable part of the healing process after removal of impacted third molar teeth.

The effect of hyaluronidase on swelling and trismus was measured in 19 patients operated on for bilateral third molar impactions. Hyaluronidase was used on one side of the jaw only, the other side being used as a control.

For the control operations, 2 cc. of 2 per cent procaine hydrochloride with 1:50,000 epinephrine was administered. For the experimental procedure the anesthetic solution consisted of 2 cc. of 2 per cent procaine hydrochloride with 1:50,000 epinephrine and 30 TRU (turbidity reducing units) of hyaluronidase. Anesthesia appeared more rapid in onset when hyaluronidase was used, and its duration seemed shorter, but no measurements were made.

Hyaluronidase significantly reduced the lateral swelling of the cheek through the fifth postoperative day. The trismus was reduced on each of the five days, but this reduction was statistically significant only on the second and third days. The cheek thickness had returned to normal by the fifth postoperative day in 70 per cent of the experimental patients and in only 10 per cent of the control group. Trismus was more pronounced on the second day in the control group, whereas in the experimental group it tended to regress after the first day. The differences brought out by millimeter measurements with calipers and Boley gauge were not so pronounced that they could be detected by clinical examination.

Hyaluronidase produced no untoward effects on the tissues or the patients.

Innovation in technique for dental gas

Tom B. Boulton. *Brit.M.J.* No. 4977:1236-1238 May 26, 1956

The use of light hypnosis as a method of preventing hypoxia during the administration of nitrous oxide to children is described. All good dental anesthetists employ hypnosis, either intentionally or unintentionally, when they "talk" their patients to sleep.

In the outpatient department the child is not premedicated. The machine is set at 100 per cent nitrous oxide with enough positive pressure to cause a steady flow of gas. The mask is not fixed to the angle piece, but is kept ready at hand for use immediately the child is hypnotized sufficiently to breathe from it without a feeling of suffocation. The child is allowed to sit or lie as he prefers. The angle piece is held 18 inches (45 cm.) in front of and above the patient's eyes. His attention is directed to this shiny object with some simple remark such as, "Now, John, I want you to look at this," and immediately the process of suggestion is begun, "and as you look at it you will begin to feel sleepy. You are feeling sleepier and sleepier; just let yourself go to sleep," and so forth. If this is said with enough confidence in a quiet, even voice and if a constant flow of words is maintained, the child begins to feel sleepy and his eyelids begin to flicker within 30 to 60 seconds. The angle piece with the gas flowing from it can be brought closer and closer to the face, and finally the mask can be fitted and applied without discomfort to the patient. Immediately the mask is applied, 15 to 20 per cent oxygen can be introduced, and after a few breaths the minor operative procedure can be carried out.

The patient recovers consciousness rapidly immediately after the mask is removed, but he should be told to wake up, to make sure that no residual hypnotic effect remains.

Experience is still being gained with this method, but the increasing success is encouraging. If the attempt does not succeed within two minutes, it is useless to persist. The most important advantages of the method are that the induction is completed without fear or discomfort, and that hypoxia is not necessary, the patient remaining pink throughout the procedure.



Fractures

On injury by fractures of the jaws to teeth in course of formation

Karen Lenstrup. *Acta odont.scandinav.*
13:181-202 Nov. 1955

Approximately 10 per cent of patients with jaw fractures are children, and several authors maintain that, on account of the presence of tooth germs, the child's jaw has a greater predisposition to fracture than that of the adult person.

The present paper sets out to clarify the late aftermath of fractures of the jaws in childhood in relation to the development of tooth germs positioned in the lines of fracture.

In the department of head and neck surgery at the University Hospital (Rigshospitalet) in Copenhagen between 1944 and 1953, 546 patients were admitted for fractures of the mandible or fractures of the maxilla. Fifty-four of these were children under 15 years of age, and in 32 of these children there were teeth in process of formation that were in the line of fracture.

In 3 of the 32 children the tooth germ lying in the line of fracture was removed during the treatment, whereas in 6 instances the original roentgenograms were not available. The remaining 23 children were called in for re-examination; 22 appeared for a general clinical examination including roentgenograms and vitality test of the teeth in question. In addition, study models were made. The period of observation of these children varied from one to nine years. Nineteen of the 22 children were between the age of 3 and 10 at the time that the fracture occurred. In three instances there had been infections after the fracture.

Only 7 of the 22 children showed normal conditions in the mouth on re-examination. In the other 15 children one or several teeth showed changes such as dilaceration (three teeth), disturbance of mineralization (four teeth), entire or

partial obliteration of the pulp cavity (eight teeth), eruption in abnormal position (three teeth) and unerupted teeth (six). Three unerupted teeth and one erupted tooth which was nonvital and showed arrested root formation were surgically removed at the time of re-examination and were examined histologically.

The length of time from accident to treatment does not appear to be decisive for the occurrence of changes in the teeth.

The dentist should not be too anxious to remove unerupted teeth lying in a line of fracture, except when infection in the region makes it necessary. It is desirable to have the patients come for examination after one year to allow early diagnosis of disturbances in the development and eruption of the teeth and to take action where possible.

Nutritional needs in fractures of jaws in children and healing processes

Ath. P. Panagopoulos and Arthur Elfenbaum.
Oral Surg., Oral Med. & Oral Path. 9:578-583
June 1956

Jaw fractures present nutritional problems accompanied by varying degrees of weight loss, systemic disturbances or oral manifestations, regardless of the age of the patient. The lack of variation in the liquid diet results in a loss of appetite and a consequent loss of weight. In children, this symptom is particularly serious, as it results in a weakening of physical resistance which predisposes to secondary infections.

Any demand made on the body, in addition to normal growth, increases the need for proteins, calories, minerals, vitamins and fat. The growth processes that occur in children of any age are put under stress when a fracture occurs.

The cooperation of a pediatrician and dietitian is suggested when the surgeon is attempting to strengthen the child by providing a good dietary schedule.

Two tables present a varied dietary schedule for (1) the normal child and (2) the child with a jaw fracture.

Basic science



Anthropology

The settlement of Polynesia

Donald Stanley Marshall. *Scient. Am.* 195:59-72
Aug. 1956

Polynesia (meaning many islands) is the largest area ever occupied by a single people—possessing the same culture, speaking the same language and having much the same physical appearance. Although its people have been intensively studied, and probably more written about than any other group in the world, the Polynesians remain one of the great riddles of human history. Where did they come from, and how did they settle their huge oceanic realm?

There are clues to suggest that the Polynesians colonized much of the Pacific at about the time the Scandinavian Vikings were sighting North America.

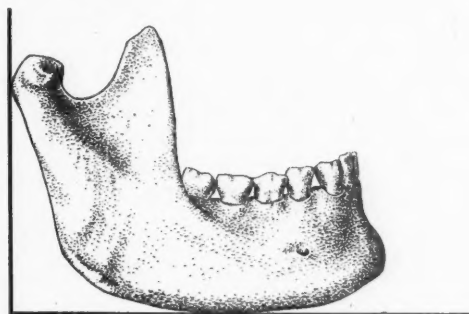
The writer believes it most likely that the Polynesians entered the Pacific from the west, and stopped at Tonga, Samoa and other islands slightly after the beginning of the Christian era and there developed Polynesian culture as it is known today. As the population increased, voyagers again ventured out in great migration canoes. This era of voyage and discovery was relatively short, but virtually every habitable island in the area was quickly discovered and settled. Probably the Polynesians remained in fairly close touch with one another; it was in this period that the legends of the great voyages between far-distant islands were established. This could have been the era of the Scandinavian Vikings, the Irish migrations and the great mass movements of wandering peoples across the continents of Asia and Europe about 1000 A.D. Then something must have happened. The Polynesians settled

down to a more stationary life. Gradually the culture of each island took a different turn. Eventually populations began to decline, and soon some islands were abandoned, with stone temples left as enigmatic evidence of their former occupation.

In the past three years Charles E. Snow, of the University of Kentucky, and the author measured more than 1,000 skulls of Polynesians of past times. They are noticeably narrower than the craniums of Polynesians of today. The trend to broadening of the cranium has proceeded at different rates in different islands, and a pattern of relationships among the islanders is observed which fits well with the groupings indicated by the stone tools and other items of material culture.

A particularly interesting aspect of the Polynesian skull is the unusual "rocker jaw"—a jaw curved on the lower side so that it rocks when laid

Rocker jaw of a Polynesian (above) is compared to the straight jaw of a non-Polynesian (below). The former rests on one point, the latter on two points or on a flat lower edge



on a table and pushed down at either end. This feature, presumably genetic, occurs in about half of all Polynesians, but it has not been observed among Micronesians and appears only rarely among Melanesians. It confirms other evidence that the Polynesians diverged rapidly from the other Pacific islanders.



Physiology

An electromyographical investigation of the functioning perioral and suprahyoid musculature in normal occlusion and malocclusion patients

Leonard Schlossberg. *Northwest. Univ. Bul.*
56:4-7 April 23, 1956

Practicing orthodontists generally agree that about 70 per cent of the persons they treat have malocclusion in Class II Division I. Muscle physiology is considered a major factor in the etiology of this dysplasia, but previous research has produced little information about the conditions prevailing in the musculature of the perioral and suprahyoid regions—muscles which assume a dominant role in this type of malocclusion.

Electromyographic records were taken from the perioral and suprahyoid muscles by placing surface electrodes over the regions in which these muscles are found.

Five boys, 10 to 14 years old, with clinically normal occlusion, and five other boys, 10 to 12 years old, with severe Class II Division 1 malocclusions were studied.

Each exercise for each subject consisted of the following: (1) assumption of physiologic rest position; (2) repetition of a standard sentence, "The Mississippi is a broad river near Churchillville"; (3) sipping water through a straw and swallowing and (4) closing normally, sucking and swallowing in sequence.

The electromyograms obtained from the normal and the Class II subjects differed. The mentalis areas were more active in Class II patients than in the normal subjects. The supra-

hyoid activity was greatest in the subject with the most pronounced Class II malocclusion and least in the most ideal of the normal group. There was a direct correlation between suprahyoid activity and severity of malocclusion.

Mentalis activity precedes activity from the lips in all Class II patients, whereas in the normal subjects mental and lip function show a high degree of qualitative and quantitative parallelism.

In the range from the most normal to the most severe Class II malocclusion, a more continuous type of activity was elicited.

Each patient has his unique pattern which clearly appeared on reperformance of the exercises.

A constant rest position can be obtained from all subjects, both normal and atypical, which is reproducible to a high degree.

Alterations of teeth, jaws and skulls caused by acromegalia

(Über die Veränderungen im Gebiss und Gesichtsschädel bei der Akromegalie)

Gustav Korkhaus. *Deut. Zahn Mund Kieferhk.*
22:93-128 June 1955

In acromegalia, in addition to the bones and soft parts of the hands, feet and face, the dental arch and especially the lower jaw are greatly enlarged.

Although the facial profile frequently shows sagittal prominence of the lower facial parts, prognathism is comparatively rare.

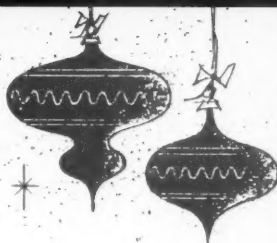
The relative independence of the mandibular, maxillary and dental arches is substantiated by various alterations in the occlusion. Of 13 patients under clinical observation at the Dental Clinic of the University of Bonn, Germany, four had normal overbite of anterior teeth despite immense skull alterations; four had edge-to-edge bite in the anterior teeth; five had prognathism, and the occlusion of the last two patients was questionable because they were edentulous.

Of 20 other patients with acromegalia who had been under clinical observation at the Dental Clinic previously, five had normal overbite of the incisors, seven, anterior edge-to-edge bite, and eight, prognathism.

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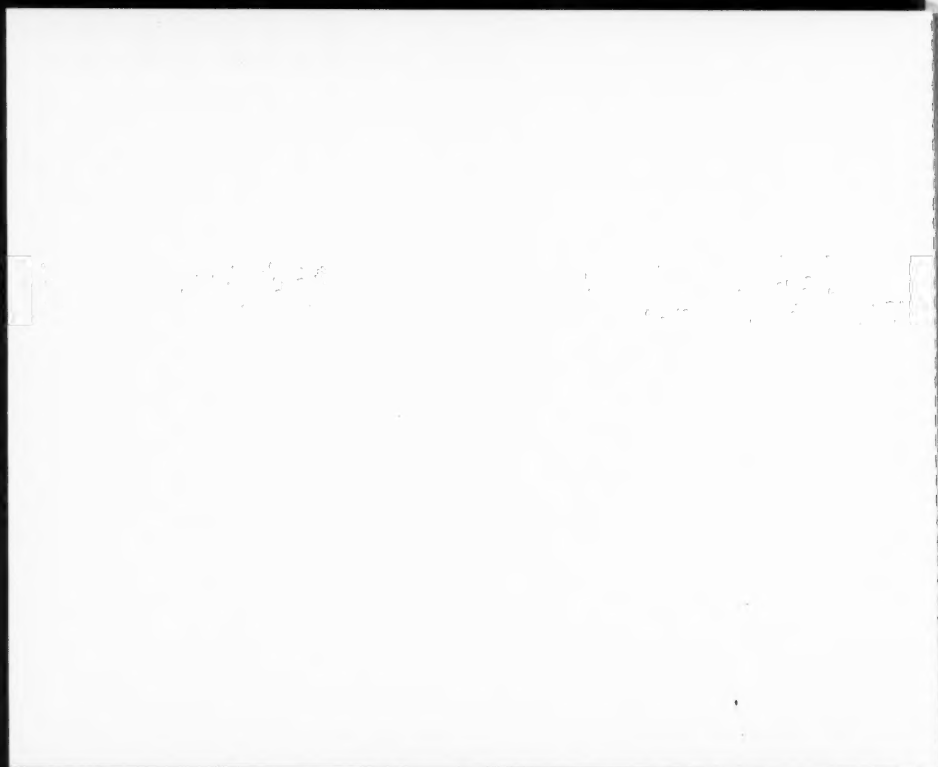
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Many other deviations of the anterior dentition were established which differed from normal types especially in the center of the dental arch.

In every acromegalic patient, an overdevelopment of the temporomandibular joint and of the mandibular rami and a characteristic tooth shifting under the constant pressure of the enlarged tongue was observed. The deviations in the lower jaw were more pronounced than those in the mandible. The occlusal changes appeared in sagittal direction either as prognathism or as edge-to-edge bite; in lateral direction as one-sided or two-sided cross-bite.

In all instances, a comparison between the anomalies occurring in the jaws and the typical symptoms of prognathism seems to disprove many orthodontic theories. Rubbrecht's investigation of profile diagrams of all members of several prognathous families seems to substantiate the results of Kantorowicz's examination of patients not related to each other: prognathism often is inherited and, although occurring in the mandible, it influences the development of the upper jaw.

Acromegalia usually is accompanied by accentuated overdevelopment of the upper anterior teeth which is followed by displacement and premature falling out of these teeth.

Underdevelopment of the mandible rarely occurs, and crowded or narrow dental arches are seldom seen. The combined action of the growth of both jaws, and the constant pressure of the enlarged tongue causes displacement of the anterior teeth and diastema. Both are characteristic signs of acromegalia.

Although acromegalic patients are often spoken of as giants, the condition of the skeleton is more in the nature of a hypertrophy or hyperplasia of some of the bones than it is a uniform overdevelopment. The conformation of the face with its sloping forehead and overhanging eyebrows is caused by an increase in size of the air sinuses, especially the anterior sinuses.

Prognathism results from an increase in size of the mandible mainly caused by periosteal bone formations. The same process occurs in the long bones of the extremities, together with osseous growth at the points of attachment of muscles and fasciae.

The acromegalic prognathism, however, pro-

duces many typical secondary phenomena and can hardly be mistaken for orthodontic prognathism. Acromegalic malocclusions are often misleading.

Additional research on all anomalies of the jaw will contribute toward an understanding of the etiology. In the future, orthodontic prognathism will be correctly differentiated from the pathologic form of prognathism occurring in acromegalia.

The effect of mastication on the digestion of food

John H. Farrell. *Brit.D.J.* 100:149-155
March 20, 1956

The value of mastication in helping to promote the digestion of food has never been proved. The effect of mastication on the digestibility of 29 commonly eaten foods was investigated, and the amount of comminution necessary for maximum digestion was assessed.

In each series of experiments, two weighed specimens of food, one of them being a control, were sewn into separate cotton mesh bags. Each bag held about 1 cc. of food, weighing about 1 Gm. The control specimen was chewed 20 times on the preferred side of the subject's dentition and the other specimen was left unchewed. The bags were tied together and swallowed and later recovered from the feces, and their contents were examined and weighed. Some 439 of these experiments were carried out by ten healthy, adult subjects.

Of the foods tested, 18 left large undigested residues in the feces if they were not chewed. They were roast pork, fried pork, fried bacon, roast beef, fried beef, stewed beef, roast mutton, stewed mutton, roast lamb, fried lamb, fried potatoes, boiled old potatoes, boiled new potatoes, boiled garden peas, boiled carrots, roast chicken breast, roast chicken leg and stewed lamb. Of these, all but the last three were sometimes incompletely digested even if chewed, although mastication always increased their digestibility. Residues (if any) from chewed specimens were usually small.

The other nine foods—fried beef fat, stewed

beef fat, fried cod, boiled cod, fried kipper, hard-boiled egg yolk, hard-boiled egg white, boiled rice, white bread, whole meal bread and cheddar cheese—were found to be digested easily whether chewed or not.

The degree of mastication required for maximum absorption of the least digestible foods was shown to be slight, and to be attainable by persons with dentitions that would normally be termed inadequate. Very little chewing is required for maximum digestion. A person having a masticatory efficiency as low as 23 per cent can masticate sufficiently well to digest any of the foods tested.

No individual variations were found in the digestive powers of the subjects.

The importance of saliva for the inorganic metabolism of dental enamel
(Snatshenie sljuny v mineralnom obmene emali suba)

L. N. Dagaeva. *Stomat., Moscow* 5:17-21
Sept.-Oct. 1955

To establish whether saliva plays an important part in the inorganic metabolism of enamel, the staff of the Dental Institute of the University of Moscow undertook serial tests on dogs. After an enteral and parenteral induction of radioactive calcium (Ca^{45}), varying values of radioactivity were found in different tooth structures. The strongest resorption of calcium occurred in the roots, and the smallest in the enamel. The topographic distribution of isotopes leads to the conclusion that radioactive elements reached the dental structures through the vessels of the pulp. Observation of radioactivity in nonvital teeth verified this conclusion. In the dentin of crowns and roots of nonvital teeth only minute amounts of radioactive calcium were detected. The enamel of these teeth, in constant contact with saliva, was highly radioactive.

Tests on human teeth, bearing artificial crowns, were conducted, and revealed that the enamel (not in contact with saliva) absorbed only minute quantities of the radioactive calcium. Small numbers of isotopes infiltrated gradually from the dentinoenamel junction. In crowned and nonvital

teeth, larger values of radioactive calcium appeared in the lower dentin layers only. It can be assumed that the isotopes found their way through the periodontal membrane and the cementum to the lower strata of the dentin.

It seems certain from these experiments that the saliva plays an important part in the inorganic metabolism of the enamel, especially in the distribution of the essential calcium.

General observations on geriatric dentistry
(Generalidades sobre geriodontologia)

Francisco Carmona Rodríguez.
An.españ.odontoestomat. 15:175-182
March 1956

The complete loss of the teeth, or their functional loss, which is in reality equivalent to the first, can be used as a basis for the classification of age from the dental point of view. This classification, which is not so hypothetical as one based on chronologic age, recognizes (1) the presenium, or initial stage, which begins with the first loss of a permanent tooth; (2) early senility, in which the teeth have been reduced to the minimum compatible with efficient mastication, and (3) advanced senility, in which the teeth are completely gone.

In support of this classification, it may be pointed out that the signs of age are generally regarded, not only by scientists but by artists and sculptors, as appearing first around the mouth. The earlier the loss of the teeth, the more adverse the effect on the beauty of the face. Moreover, digestion, which begins with mastication, and distinctness of speech are impaired when the teeth are lost. Clearly, then, when the first permanent tooth is lost, not by accident but as a result of disease, the phase of involution or dental senility has begun. Efficient mastication has been said to require the presence of at least three teeth with their antagonists. Statistical studies suggest that many men now reaching old age have no more than six teeth left, that is, they are in the stage of moderate dental senility. As for those who are edentulous, their advanced senility from the dental point of view can scarcely be questioned.

With life expectancy increasing as it has in re-

cent years, geriatric dentistry is becoming more important. The principal elements to be considered in providing adequate dental care for the aged are the soft tissues, the hard structures, and the temporomandibular joint. In the aged, the protective layer of keratinized cells covering the soft tissues atrophies and disappears, so that normal physiologic resistance to bacteria and to harmful physical and chemical agents is reduced or abolished. Glandular secretions diminish, leaving the tissues uncomfortably dry and making the retention of prostheses difficult. The tongue, too, is adversely affected, and the rugae which characterize the gums and oral tissues of a healthy adult are often lacking in the aged.

The hard structures, that is, the bones and teeth, undergo degenerative changes, such as rarefaction of the bone and discoloration, demineralization, and attrition of the teeth. Mechanical disturbances of the teeth affect the temporomandibular joint, resulting in malocclusion and often causing unattractive protrusion of the lower jaw.

Dental treatment should not be given to aged patients in the same form as to those who are young or middle-aged; for instance, the reduced metabolism of the aged leads to slower elimination of anesthetic agents. Smaller quantities should therefore be given, and chloroform and ethyl ether should not be used at all, because of their toxicity. Psychic factors, too, such as the introspection of the aged and their desire for attention, especially from members of their families, should be recognized. Patients who are to receive complete prostheses should be instructed in their management and helped to acquire the ability to use them effectively. Prolongation of life is not the sole purpose of geriatrics: the aged deserve all the care that science can give to make the brief way they have yet to travel smooth and agreeable.

Observations on replanted teeth plated with gold foil

Jens Waerhaug, Oslo. *Oral Surg., Oral Med. & Oral Path.* 9:780-791 July 1956

Gold crowns and fillings, extending below the gingival margins, usually are considered to be well tolerated by gingival tissues, although his-

tologic investigation corroborating such statements is lacking.

The study reported is one in a series of experiments set up to study the gingival reaction to common materials used for restorations. Twelve teeth in four healthy young monkeys were extracted and their roots were filled. Gold foil was glued to the mesial and distal surfaces of the teeth with chlorophencha. The teeth were replanted in their sockets and ligated to the adjacent teeth. After periods of from 33 to 85 days it was observed that the replanted teeth had become attached to the jaw with a bony connection in the unplated regions. The gold-plated parts were covered completely with epithelium. Where the gold foil was still attached to the tooth, it was joined by apparently normal epithelial cells. In the majority of teeth, all or most of the gold foil had loosened and the detached pieces invariably were covered with epithelium which either was normal or showed varying degrees of degeneration. The connective tissue around the detached gold foil was more or less inflamed and the pieces of foil were expelled like foreign bodies.

An analysis of the mandibular movement from rest to occlusal position: a roentgenographic-cephalometric investigation

K. Nevakari, Helsinki. *Acta odont.scandinav.* 14, Suppl.19:1-129, 1956

Studies published in recent years on the positional relation of the mandible to the skull and on movements of the mandible have devoted much attention to its rest position and to the movement from rest to occlusal position.

The aim of this study was to try to ascertain whether the movement of the mandible from rest position to occlusal position is a pure hinge movement with the axis through the condyles, and, if not, how it deviates from a pure hinge movement. The investigation was carried out at the Institute of Dentistry, University of Helsinki, the subjects being dental students. The following conclusions were reached:

1. In the subjects examined, the movement of the mandible from rest position to occlusal posi-

tion was not a pure hinge movement with the axis through the condyles.

2. The geometrically constructed theoretical axis for the said movement in all instances was situated outside the condyle, and its location exhibited considerable individual variation. On the average the axis of the movement was located near the mastoid process.

3. On the mandible's closing from rest position, the deviation from a pure hinge movement measured at the cuspid point averaged about 1 mm. in the distal direction.

4. The condyle also underwent a translatory movement, the magnitude of which averaged about 1 mm. backward and upward on the mandible's closing from rest position.

5. The direction of the path of closure measured at the cuspid point averaged about 11 degrees in relation to a perpendicular of the Frankfort plane, or upward and slightly forward.



Biochemistry

Fluorine in urinary tract calculi

John R. Herman. *Proc.Soc.Exper.Biol.& Med.* 91:189-191 Feb. 1956

The pathogenesis of urolithiasis (urinary calculi) is one of the unsolved problems in modern medicine. Parts of the stones from ten instances of urolithiasis were analyzed for calcium, ammonium, magnesium, oxalates, phosphates, urates, carbonates and fluorine. It is important to note that fluorine has been found in urinary calculi with frequency.

Whereas normal human teeth and bones contain from 10 to 30 ppm of fluorine, the fluorine content of the urinary calculi examined ranged up to 1,790 ppm. From the data on specimens in which calcium content could be determined, it was noted that when calcium content is high, fluorine values are also high; in the two calculi in which no calcium was found, fluorine content was low.

Permeability of fluoridated teeth to uranium salts (Permeabilidad de los dientes fluorados a las sales de uranio)

Carlos M. Meroni, Daniel E. Pujo, Carlos Culo and Adriano Malusardi. *Rev.A.odont.Argentina* 43:351-352 Sept. 1955

Experiments were made on young dogs with perfectly normal enamel. The upper incisors and upper canines were used for the *in vivo* tests, whereas the incisors and canines of the lower jaw were used for the *in vitro* tests. In dog no. 1, the upper teeth, previously isolated, were treated topically with a 1 per cent uranyl nitrate solution for four minutes a day, for four consecutive days, with a total period of topical application of 16 minutes for the entire treatment. After completion of topical treatment of the upper teeth, the lower teeth were removed by alveolectomy, washed in water from the faucet for two minutes and then washed in distilled water for another two minutes, after which the teeth were placed in a 1 per cent uranyl nitrate solution for 16 minutes.

In dog no. 2, the upper teeth, previously isolated, were treated topically with a 2 per cent sodium fluoride solution for four minutes a day for four consecutive days up to a total period of 16 minutes. Then the same teeth were treated topically with a 1 per cent uranyl nitrate solution for four minutes a day for four consecutive days up to a total period of 16 minutes. The lower teeth were removed by alveolectomy, washed in a similar fashion to those of dog no. 1, and placed first in a 2 per cent sodium fluoride solution for 16 minutes and then in a 1 per cent uranyl nitrate solution for 16 minutes.

All upper and lower teeth were exposed to a dental roentgenographic plate for two months. At the end of this period the plates were developed. The enamel surface of the upper teeth showed a small deposit of uranium salts, but there was no difference between the teeth treated only with uranyl nitrate and those treated with sodium fluoride prior to uranyl nitrate, probably because the time of exposure of the teeth to sodium fluoride was not long enough to diminish the permeability of the enamel. Of the teeth observed in the *in vitro* experiment, the surfaces of those which had been placed in uranyl solution ex-

hibited a greater radioactivity than those which had been placed first in sodium fluoride and then in uranyl nitrate. The teeth submerged in sodium fluoride first and then in uranyl nitrate exhibited only weak traces of radioactivity. Greater penetration of radioactive substance was seen in the zone of the dental cement. Penetration in the surface of the enamel was very slight.



Histology

Roentgenspectrographic studies of teeth (Röntgenspektrografiska studier av tänder)

Hans Rockert. *Odont.Tskr.* 63:500-505 Dec. 1955

A study of the mass absorption coefficients for the elements present in tooth substance reveals that the absorption curve for calcium has several maxima, one of which is the K-edge at 3.07 angstrom which is within the roentgen-ray region of the spectrum. All the other elements, except potassium which is present in low concentrations, have maxima at 25 angstrom or more.

Microroentgenographic studies in the 1930's (Bodecker, Applebaum, Heiwinkel, Van Huysen and Warren) were limited by the lack of x-ray tubes of sufficiently long wavelength and by lack of film emulsions with fine enough grains. Only weakly blackened areas representing enamel and dentin were visible, with a faint indication of Hunter-Schreger lines, and decalcification was observed around carious lesions.

A Machlett AEG 50 tube with a 1 mm. beryllium window was used at 50 kv., giving wavelengths from 2.5 to 4 angstroms. Ground sections of 20 microns thickness, prepared by the method described by Hammarlund-Essler, were used on spectroscopic analysis plates no. 649, Lippmann-film, and Kodak maximum resolution film.

Quantitative determinations of roentgen-ray absorption can be carried out using aluminum foil wedges, so that the absorption can be expressed in millimeters of aluminum. Another reference system is polyvinyl alcohol with a known

amount of calcium dissolved. This material may be cut in the microtome to the desired thickness.

Blackening of the films is measured by a photocell-photometer which permits determinations of areas as small as three square microns.

Lines of Retzius are clearly visible. Hunter-Schreger lines are generally at right angle to the enamel-dentin junction. Both types of structures are caused by the periodicity of the mineralization. In spite of the evidence presented by Hollander and others (1935), some authors still maintain that the Hunter-Schreger lines are caused by an optical phenomenon.

The junction between enamel and dentin is well defined since the dentin has a lower absorption of roentgen rays.

Enamel tufts and enamel rods, dentinal tubules and von Ebner lines are illustrated and discussed.

Roentgenspectrographic examinations of teeth offer a promising method for qualitative and quantitative studies of several problems such as the calcium content around carious lesions, in rachitis, and for studies of the calcium:phosphorus balance in teeth.



Pharmacology

Acute and subacute toxicity studies of sodium fluoride in animals

Nicholas C. Leone, Erving F. Geever
and Neil C. Moran. *Pub.Health Rep.* 71:459-467
May 1956

A study was undertaken to obtain data on the acute and subacute physiologic and pathologic effects of intravenously and orally administered sodium fluoride in dogs and mice. It was demonstrated that:

1. The mean acute lethal dose of sodium fluoride in unanesthetized dogs infused to death by continuous intravenous infusion at the rate of 5.4 mg. of fluoride ion per minute was 36.0 ± 0.5 mg. per kilogram. The principal effects were progressive depression of blood pressure, heart rate and central nervous system with vomiting and defeca-

tion, all occurring with the administration of approximately 20 mg. per kilogram. At a mean dose of 30.6 mg. per kilogram there was a depression of respiratory rate and a conversion to atrioventricular nodal or ventricular rhythm with terminal ventricular fibrillation or asystole.

2. In a group of dogs infused intravenously with selected fractions of the acute lethal dose, an approximate LD_{50} was estimated to be 20 mg. per kilogram. The major effects observed in this group were vomiting, defecation and central nervous system depression. In the fatal instances death occurred in from 1 to 36 hours.

3. In a group of dogs given 5 mg. per kilogram intravenous injections daily for 23 consecutive days, no toxic effects were observed.

4. In dogs, single doses up to 3,100 mg. per kilogram of fluoride by mouth produced only vomiting, defecation and transient moderate depression.

5. The intravenous LD_{50} in mice was 23.0 ± 0.9 mg. per kilogram and the oral LD_{50} , 46.0 ± 1.6 mg. per kilogram.

6. A slight drop in serum calcium followed the infusion of fluoride in most dogs in which serum calcium was determined.

7. The pathologic findings in those animals which died directly as a result of sodium fluoride administration consisted of generalized hyperemia and acute focal hemorrhages.



Pathology

Sinusitis of odontogenic origin

(Sinusitis odontógenas)

E. García Martínez. *An.españ.odontoestomat.*
15:343-352 May 1956

Maxillary sinusitis of dental origin is more common in persons between the ages of 25 to 42 than in any other age group. The main causal factors are (1) a tooth root or a fragment of a root that remains after a tooth extraction, along the line of the sinus, acting as if it were a foreign body and causing resorption of the bone tissue and (2)

a root abscess or periodontal disease that causes destruction of the periodontal membrane, suprapical osteomyelitis, disruption of the mucous membrane of the antral floor and closed antral empyema.

When the tooth is extracted the sinus is entered. The teeth which may spread infection to the maxillary sinus are, in order of frequency, the first molar and second bicuspid, the second molar, first bicuspid and cuspid, and the third molar. Extraction of an infected tooth during the period of closed empyema establishes free drainage of pus through the alveolus and is followed promptly by cure of maxillary sinusitis. If the infected tooth is not extracted at this stage, empyema causes perforation of the mucous membrane, and acute empyematous maxillary sinusitis develops. The nasal and general symptoms correspond to the degree of antral inflammation and to the severity of the infection.

The main symptoms and characteristics of the disease are the occurrence of trigeminal and orbital neuralgia, fever and formation and elimination of fetid pus, toothache, and a sensation of looseness and elongation of the teeth below the empyematous region. The most common complications are ascending osteitis and frontal and ethmoidal sinusitis. If acute empyematous maxillary sinusitis is not controlled within two months or more after the onset of the disease, the prolonged contact of the antral mucous membrane with pus causes polypoid degeneration of the membrane and chronic empyematous maxillary sinusitis. The general symptoms diminish but the patient continues to lose weight and suffers mental depression.

The prognosis of empyematous maxillary sinusitis of dental origin (either acute or chronic) is favorable. Cerebral or intracranial complications are rare. Sinus puncture with aspiration of sinus exudates alone or followed by antrostomy or else antroscopy is the best procedure for the diagnosis. Identification of apexes and of regions of rarefying osteitis within or without the sinus is made by taking an intrabuccal roentgenogram in addition to the extrabuccal roentgenogram that is made for diagnostic purposes.

Conservative and surgical treatment have their own indications. Blind curettage of the antral mucosa is contraindicated in empyematous maxil-

lary sinusitis of dental origin since the sinus walls may be denuded of the periosteum with consequent development of osteitis. Intra-antral injection of antibiotics after extraction of the infected tooth gives satisfactory results. The injection is made, under local anesthesia, through a puncture in the lower nasal meatus with aspiration of exudates. A program for the conservative treatment of empyematous maxillary sinusitis of dental origin is described.

In operations for empyematous maxillary sinusitis of dental origin, the sinus cavity should be isolated from the buccal cavity in order to prevent ascending infection. In order to prevent exposure of the maxillary sinus during the extraction of tooth roots and apexes of the upper first molar and upper second bicusps, the extraction should be carried out with close attention paid to the roentgenograms taken before the extraction.

Cementoma (Cementoma)

Pedro Henríquez. *Gac.odont.* 2:112-113
Aug.-Sept. 1955

The benign, asymptomatic tumors known as cementomas, cementoblastomas, osteitis fibrosa, fibro-osteomas, periapical fibromas, periapical ossifying fibromas and so forth are seldom detected except on roentgenographic examination. They are found much more frequently in women than in men. The lower jaw is the principal site of these tumors, which may occur even in edentulous spaces. They have been ascribed to such varying causes as hyperparathyroidism, syphilis and other systemic diseases, injury and occlusal trauma, but none of these as yet has been proved responsible for their occurrence. Their development, which is slow, begins with an indefinite period of fibroblastic proliferation in the apical region, accompanied by osseous rarefaction, and is completed by calcification which transforms the tumor into a cementous mass.

Although the lesion is discovered on roentgenographic examination, the roentgenogram may be confusing, because the appearance of the lesion depends on the degree of calcification present. The diagnosis will be facilitated if the following three stages are kept in mind:

1. Osteolytic. When the tumor is formed by cellular structure without calcification, it develops at the expense of the bone, which it destroys. The roentgenogram, therefore, shows a radiolucent zone in the periapical region, closely resembling that found in granuloma. Differential diagnosis in this and the other phases may be made by testing the vitality of the pulp.

2. Cementoblastic. In this stage, the formation of cement has begun and there is a radiopaque zone related in size to the amount of cement already formed. At times, cementomas in this stage may appear to be surrounded by a zone of osseous condensation.

3. Adult. When calcification is complete, the roentgenogram shows a definitely radiopaque area, surrounded by a delicate radiolucent line which represents the remnants of the connective tissue.

Inasmuch as fully developed cementomas have no further tendency to progress, they require no treatment. They should, however, be examined roentgenographically at periodic intervals.

Diseases of the salivary glands

G. S. Fitz-Hugh, F. H. McGovern and
W. E. Craddock. *South.M.J.* 48:491-497
May 1955

Diseases of the salivary glands may be divided into three groups: inflammatory, neoplastic and miscellaneous.

Epidemic sialadenitis is a well-known viral disease, which may be complicated by encephalitis and inflammatory involvement of the eighth nerve, resulting in permanent deafness. A method of preventing the complications of mumps is not known, but complete rest during the acute episode is advisable. Chronic suppurative parotitis, with recurrent acute episodes, is not uncommon, particularly in older children. In adults, suppuration of the submaxillary glands, secondary to obstruction from a calculus, frequently is encountered. Mikulicz's disease is supposedly an infectious granuloma, involving the salivary and lacrimal glands. There is, typically, bilateral and symmetrical, painless enlargement of the salivary and lacrimal glands. Mikulicz's syndrome in-

cludes conditions associated with the clinical and histologic picture of tuberculosis, syphilis, sarcoidosis and lymphosarcoma. Actinomycosis may involve the salivary glands secondarily, by direct extension from adjacent regions.

Of the neoplastic conditions, the most common tumor of salivary gland origin is the mixed cell one, and the most frequent site is the parotid gland. In considering all neoplasms of salivary gland tissue, about 87 per cent occur in the parotid gland, 12 per cent in the submaxillary, and less than 0.5 per cent in the sublingual.

The third or miscellaneous classification contains a large and varied number of conditions. Calculi are most frequently found first in the submaxillary duct, then the gland; next, in the parotid gland, then the duct, and lastly, in the sublingual gland. Various theories have been proposed to explain the presence of the concretions, but no definite cause is known.

Sialoangiectasis of the glands may occur as the result of inflammation, but instances have been known when no evidence of present or past inflammation could be demonstrated. Allergy has been suggested as the cause.

In the event of suspected calculi within the ducts or gland tissue, their presence usually can be confirmed by roentgenographic demonstration. Examination of the secretions expressed from the ducts grossly, microscopically and bacteriologically, may give useful information. Bacteriologic studies of the secretions are useful in diagnosis, and in the choice of the antibacterial drug to be used in treatment.

**Dental deformation of traumatic origin:
report of case** (Sobre un caso de deformación
dentaria de origen traumático)

C. Giustina. *An.español.odontostomat.*
14:759-770 Oct. 1955

Obstetric trauma to the anterior part of the maxilla at birth, and operative or accidental trauma to that region during infancy, may interfere with the cycle of normal development of the dental follicles with consequent migration of the follicles,

disorders in the formation of the permanent teeth and abnormalities of the permanent teeth. The most frequent abnormalities of the permanent teeth are macrodontism, deformation of the crown and torsion and irregularities of the root.

A case of macrodontism is reported in a youth 16 years old. The mother stated that the patient was normal until he was nine months old. At that time he fell on his face, with great trauma to the maxilla, and lost the upper right lateral and central incisors. When the child was eight years old, a macrodontic upper right central permanent incisor with a deformed crown appeared and began to grow.

When the patient was observed at the age of 16, the macrodontic incisor occupied the entire space in the dental arch which corresponded to this tooth as well as to the lateral incisor which had never appeared. The tooth grew 4.5 mm. distally in the dental arch in relation to the upper left central incisor, which was normal. The crown showed deformations similar to those characteristic of Salter's tooth. The macrodontic tooth caused no subjective disorders to the patient, who was otherwise normal, but it marred the normal appearance of his mouth. The patient requested that the tooth be extracted.

Roentgenographic examination of the anterior part of the maxilla showed that the root of the tooth was curved upward, turning the tooth in a distal direction. The upper right lateral permanent incisor was wedged in the alveolar process in an oblique and mesiodistal position, behind the macrodontic tooth. The grave deformity of the tooth made it unfit as a stump for a prosthesis, and it was decided to extract it and then give orthodontic treatment. The macrodontic tooth was extracted. Histologic examination showed that the deformity of the crown was due entirely to irregular development of the enamel and, to a lesser degree, of the dentin, and this definitely was the result of trauma to the dental follicles.

The patient at present is receiving orthodontic treatment, which is aimed at correcting the position of the impacted tooth and at assisting its eruption. At the end of the treatment, the lateral incisor will be used as an abutment for a prosthesis for the extracted right central incisor.

Preventive and public health dentistry



Caries etiology and control

Importance of carbohydrates in the etiopathology of dental caries

(L'importanza dei carboidrati
nell'etio-patogenesi della carie dentaria)

G. Nieddu and B. Angelillo. *Clin.odont., Roma*
11:3-9 Jan. 31, 1956

To obtain a factual scientific evaluation of the cariogenic effect of different forms of carbohydrates, the staff of the Dental Clinic of the University of Sassari, Sardinia, Italy, recently undertook serial experiments on humans and on animals. In these tests, the essential etiologic factors of the carious process, and the action and reaction of the dental bacterial plaques through which the carbohydrates must act to become cariogenic, were investigated.

The cariogenic agents under the fermenting action of the enzymatic system produce lactic and pyruvic acids. These and other still unknown cariogenic factors appear beneath the bacterial plaque and neutralize the antibacterial activity of the saliva.

The first tests were made with three groups of patients. No special differentiation was attempted with regard to resistance or susceptibility to caries.

The patients of the first group received carbohydrate in the form of candies. Those of the second group ingested 5 Gm. of saccharose (sucrose). To the third group, 5 Gm. of glucose (dextrose) was administered.

Immediately after intake, the pH action and the reaction (with Fehling's solution) were determined.

In both the first and the third group, a pH action appeared within from 5 to 25 minutes and returned to normal within 60 minutes. Nearly

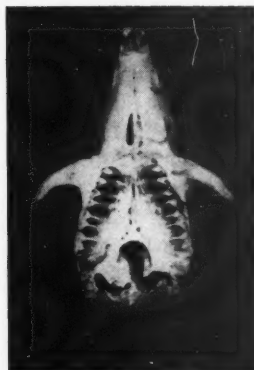


Figure 1 Upper jaw of a rat fed with normal diet. Severe abrasion and pigmentation of all teeth

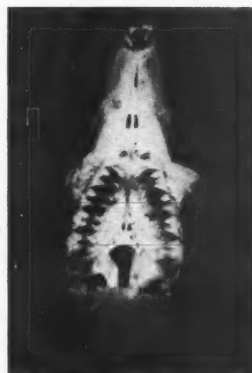


Figure 2 Upper jaw of a rat fed with diet free of carbohydrates. Less abrasion and pigmentation

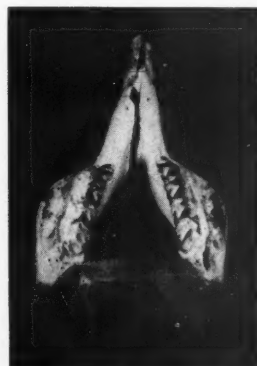


Figure 3 Lower jaw of a rat fed with normal diet. Abrasion and pigmentation of all teeth

parallel was the reaction test with Fehling's solution. Immediately after ingestion of carbohydrates, the reaction was positive and decreased gradually to negative within from 20 to 25 minutes. In the second group, however, only a normal reaction was observed.

Three additional groups of patients then were formed. After taking carbohydrates, the patients of the fourth group rinsed their mouths with fresh and pure water. Those of the fifth group cleaned their mouths with a neutral soap solution. In both groups, without essential differences, Fehling's solution test revealed a negative reaction within 10 minutes, and the pH test showed a descending curve to a normal (low) acid value after from 10 to 15 minutes. Patients of a sixth group rinsed their mouths with water immediately after carbohydrate intake and repeated this process ten times. The cleansing process took about 90 seconds. No deviation from normal was observable in this group.

Progressive rinsing with water, after ingestion of sugary substances, is a simple procedure to eliminate the cariogenic effects of carbohydrates, and can be utilized as a caries-preventive measure. Such a procedure cannot cause erosion of the enamel which often results from using toothbrushes.

Similar tests were made with white rats. These caries-susceptible animals were raised in a germ-free condition and were found to be caries resistant even when fed a cariogenic diet of pure sugar. A definite contrast was established when the results were compared with those obtained with rats that had not been kept in germ-free condition and that had various microorganisms, mainly lactobacilli, in their mouths. In this animal group, an acid reaction occurred, paralleled by a multiplication of bacteria. The high degree of acidity caused decalcification of the enamel. Fermentable carbohydrates were found to be the source, in human and animal experiments, of the bacterial production of acid. Carious lesions appeared within two months after administration of carbohydrates to the second rat group. The cariogenic diet consisted of fructose, glucose and raw corn starch.

The findings presented support the theory that it might be possible to measure differences in the properties of foodstuffs which are associated with the capacity to produce caries.

Army approves fluoridation

Editorial. *New England J. Med.* 254:1242-1243
June 28, 1956

At the time of the American Civil War, prospective candidates for the Union Army were disqualified for service on the firing line if they lacked certain natural strategic dental equipment. These teeth were needed to tear open a form of paper cartridge, and it is said that occasionally men had them extracted, to avoid the draft.

It would appear that the Army, in authorizing the fluoridation of drinking water at 21 posts in the United States, Alaska, Hawaii and Puerto Rico, had in mind the indispensability to the soldier in 1861 of a certain number of sound opposing teeth, were it not for the fact that the presence on the post of a quota of children below military age is an essential requirement for fluoridation.

Perhaps the necessity of healthy teeth to a nation's future soldiery has had some influence on the more vigorous opponents of fluoridation. The Army's approval of the practice may still further strengthen their opposition.

The importance of chelation for future caries research

(Die Metallchelatierung und ihre Bedeutung
für die künftige Kariesforschung)

H. Eggers-Lura, Holbaek, Denmark.

Deut.zahnärztl. Zschr. 11:543-551 May 15, 1956

Recent histologic research has revealed the important role the chelation phenomenon plays in resorption of teeth and bones. The mechanism involved in chelating processes includes the effects of the following nonacid agents: (1) proteolytic enzymes; (2) phosphatases, and (3) heterocyclic substances.

Established evidence indicates that these nonacid agents are active in the development of dental caries. Consumption of large quantities of sucrose leads to the destruction of hard tooth tissues without the involvement of acid effects. Sucrose and several of its intermediary, neutralized degradation products may enter in cyclic

complexes with the enamel calcium after it has been enzymatically attacked by the proteases and phosphatases of oral bacteria. The result is a formation of soluble compounds at a neutral pH.

The main objections to the acidogenic theory in caries pathogenesis include the following: (1) organic and inorganic constituents of tooth substances are attacked simultaneously in spite of the fact that different pH conditions are required; (2) caries resistant salivary types form as much (or even more) acid as do caries susceptible salivary types; (3) acids formed in plaques and saliva are neutralized quickly or eliminated by bacterial oxidation, and (4) sucroses and fructoses which as carbohydrates are most conducive to caries do not form more acid by bacterial degradation than do other carbohydrates which are less conducive to caries; for example, starches or maltoses. Sucrose has a specific property and forms calcium complexes such as saccharate formation and chelation.

The anticaries properties claimed for fluorides also can be understood in terms of chelation because fluoride may associate with keratin and apatite in tooth enamel. Such a condition may cause differences in optical opacity that would explain "mottled enamel," and at the same time it may influence resistance to caries.

Teeth treated with fluorides are more resistant to chelating agents than are nontreated teeth.

Nutrition as related to experimental caries in animals

(La carie expérimentale chez l'animal et l'alimentation)

D. Dalderup. *Zahnärztl. Praxis* 7:4 June 1, 1956

The development of dental caries in strains of rats, highly susceptible to caries, has been studied recently in the Netherlands.

By using a microscopic scoring technic, it was possible to observe, evaluate and record carious lesions in the earliest stages, before cavities in the surfaces of the involved teeth appeared.

Fissural caries is the most common type, and is far more destructive than proximal caries.

The cariogenic diet, fed to the experimental rats, was similar to that consumed by the Dutch

population, and consisted of at least 41 per cent white bread (dried and ground).

Other types of basic diets, containing mainly coarsely ground wheat and barley, have proved to be noncariogenic in the experimental rats.

Even if the findings obtained in animal experiments cannot be applied fully to human patients, the influence of nonnutritional factors such as the complex of bacterial, chemical, mechanical and salivary agents on the development of caries cannot be overemphasized.

How effective is fluoridation?

H. Trendley Dean. *Nat. Parent-Teacher* 50:28-30 May 1956

Although a link between fluoride and dental health was detected in the last quarter of the nineteenth century, early papers on the subject were based largely on speculation or questionable chemical data. In 1916 Black and McKay observed that mottled enamel was caused by some substance in the drinking water imbibed during the formation of the teeth. Further studies showed that teeth with mottled enamel showed less tendency to decay than those without mottled enamel. Other outstanding studies of mottled enamel were carried on in North Africa and in Argentina. The work of Chaneles and Erausquin, Argentinian scientists, suggested a tie between mottling and tooth decay.

Studies of the relationship between fluoride and dental health demonstrated the following: (1) that mottled tooth enamel is linked with the amount of fluoride in the water supply; (2) that there is a fluoride level that is ideal for dental health, and (3) that in communities where relatively fluoride-free water supplies have been brought up to ideal levels, tooth decay has been reduced.

The studies of dental decay and fluoride in Galesburg and Quincy Ill., Grand Rapids, Mich., Newburgh, N.Y., and Brantford, Ont., are reviewed.

In 1956, more than 1,100 communities in the United States were using fluoridated water supplies. Other countries using this control measure include Canada, Brazil, Chile, Colombia,

Germany, Japan, the Netherlands and Sweden.

Fluoridation is a proved public health measure for the partial control of dental caries. With fluoridation it is now possible for man to duplicate the workings of nature to serve his own well-being. Civilized man's most common disease can be sharply curtailed by a preventive measure that is effective, inexpensive and safe.

Fluoridation has been supported by the National Congress of Parents and Teachers. People who oppose fluoridation do so because they have been given insufficient, inaccurate information, or because they have misinterpreted the available evidence.



Epidemiology

Geographic variations of dental caries in Oregon: VII. Caries prevalence among children in the Blue Mountain region

D. M. Hadjimarkos. *J. Pediat.* 48:195-201
Feb. 1955

A series of regional epidemiologic studies on dental caries has been conducted in the State of Oregon among native-born and native-reared white children. The observed differences in DMF teeth rates between the subjects examined in the Blue Mountain region and those found among the children of the four other geographic regions of Oregon were tested for significance by the analysis of variance. The only significant finding was the existence of an inverse relationship between the condition of the sky, in combination with altitude, and caries prevalence rates. Children born and reared in the part of Oregon located west of the Cascade Range have higher rates of caries prevalence in comparison with subjects reared east of the mountains. Eastern Oregon has more days of sunshine, considerably higher elevations and a type of agriculture and vegetation corresponding to arid and semiarid climatic conditions.

The existence of an inverse relationship between caries prevalence and the amount of available sunshine in a locality may be explained as

follows: The biologically effective component of the ultraviolet radiation of the sun stimulates the production of vitamin D by acting on the provitamin located under the skin surface. There are indications that an adequate vitamin D intake during the calcification period of the teeth renders them more resistant to caries attack, other factors being equal.

Knowledge of the relation between sunshine and dental caries prevalence will be enhanced by the availability of an apparatus for measuring the biologically effective component of the ultraviolet radiation of sunlight in a locality.

A preliminary study was made among children living in two regions located east and west of the Cascade Range on the possible influence of the trace element selenium on caries susceptibility. A direct relationship was found between urinary selenium concentration and caries prevalence rates. Further studies on these influences are now in progress.

Oral health study in children of suburban Washington, D.C.

A. L. Russell. *Pub. Health Rep.* 71:626-632
June 1956

A continuing study of oral health in elementary and junior high school children of Montgomery and Prince Georges counties, Md., is being conducted by the National Institute of Dental Research, U.S. Public Health Service. The study is not designed as a test of the fluoride-dental caries relationship, but has the objective of augmenting the descriptive epidemiology of dental caries and laying a foundation for a descriptive epidemiology of periodontal disease as it first appears in relatively young persons.

The present report is limited to observations on dental caries. The domestic water used by these children residing in two counties adjacent to the District of Columbia was fluoridated late in December 1951.

The examination criteria for dental caries and the methods in use are described, as is the population under observation. Evidence is presented that there was a statistically valid decrease of roughly 20 per cent in the number of permanent

teeth becoming carious during the second year of fluoridation, judged by findings from the baseline examination early in 1952.



Hygiene and prophylaxis

Changing concepts in oral care

P. O. Rosendahl. *North-West Den.* 35:157-159 May 1956

The correct toothbrushing technic is difficult for most people to learn. Many dental patients persist in using haphazard, slovenly methods of brushing their teeth. The small percentage of patients who master the intricate technic of toothbrushing obtain most beneficial results.

Proper toothbrushing by hand cannot be taught most patients. The use of an electric motor for achieving a scientifically controlled toothbrushing technic is a progressive health measure against caries and periodontal disease. Dentists have obtained good results through prescribing electrically propelled toothbrushing methods to their patients. Such methods lower the incidence of caries and diseases of the soft tissues when caused primarily by incorrect toothbrushing.

Dental researchers might well concentrate on a study of toothbrushing.

Discoloration of gingiva and teeth by stannous fluoride

Max Shapiro and Jewell Lee Hood. *J. California D.A. & Nevada D.Soc.* 32:174-177 May-June 1956

The staining effects of stannous fluoride in the concentration used in the commercial dentifrice applied on the human teeth and gingiva *in vivo* were studied. Twelve teeth in five adult patients were treated *in vivo* with a 0.4 per cent aqueous stannous fluoride solution. The teeth were rinsed thoroughly and painted with an aqueous hydrogen sulfide solution. Kodachrome photographs were taken before, during and after treatment.

All teeth showed staining from light tan to brown with areas of calculus, cementum or dentin darker in color than the enamel. Polished teeth seemed to stain darker than unpolished teeth. The gingival tissues developed a light tan color. After three minutes of polishing a half of each extracted tooth, only a slight change in color resulted. Histologic examination of the gingiva revealed a slight loss of the outer layers of the epithelium which appeared parakeratotic.

It appears that the use of stannous fluoride tooth paste as a means of caries control is impractical because of the possibility of developing a deep stain in the tissues of the teeth. Although the stannous ions may give a measure of caries control in humans, a long-term study of the staining problem appears necessary prior to the release of stannous fluoride tooth paste to the public.

Statistical research

A statistical investigation

of gingival pigmentation (Shigin no shikiso chinchaku no tokeiteki kansatsu)

Yoshiaki Ando, Takeshi Suetaka and Isao Sakuma. *Shikwa Gakuho* 56:93-100 March 1956

Some 827 Japanese, 406 male and 421 female, from 1 to 77 years old, were examined for the black or brown pigmentation of melanin on the gingiva. The incidence of pigmentation observed in patients suffering from periodontal disease was 68.0 per cent in the male and 46.7 per cent in the female—higher than those in all patients—43.0 per cent in the male and 29.6 per cent in the female. The incisor region of the gingiva, especially that of the lateral incisor, was most frequently affected by pigmentation, averaging 10 to 20 per cent, and it decreased substantially toward the posterior segment of the mouth. In a few instances pigmentation appeared on the entire gingiva. It was also found more frequently at the ages between 21 and 40 years in men and between 11 and 20 years in women. The pigmentation in men was found on the upper anterior seg-

ment more commonly, but, in the women the lower anterior portion was involved more frequently. Some morphologic differences in the pigmentation were noted, as expressed by diffuse, wedge-shaped, arched, circular, punctiform, and belt-form pigmentation. The diffuse pigmentation was very common among Japanese. The pigmentation in Negro U.S. soldiers observed in the present investigation was extreme; the incidence was 100 per cent, 70 to 80 per cent of which appeared in the incisor region.

The teeth of Maori girls at Hukarere College

L. J. Coxhead. *New Zealand D.J.* 52:86-87
April 1956

Hukarere College in Napier is a secondary school for Maori girls. Of 40 new entrants in 1954, the teeth of 13 were reasonably clean; the oral hygiene of the remaining 27 was indifferent or poor. In the early part of this century Pickerill and Champaloup found that the mouths and teeth of the Urewera Maoris were all very clean.

Most of the girls had wide, square dental arches and well arranged teeth. Thirty-four girls had normal occlusion; three had end-to-end occlusion, two had Class II occlusion, and one had a protrusive bite. Three girls had crowded anterior teeth, two had an open bite and seven had a posterior cross-bite. In three, retention of deciduous teeth was prolonged.

Five girls had slight gingivitis, three had moderate gingivitis and one had severe gingivitis. Calculus was observed on the lower anterior teeth in five girls, and was general throughout the mouth in a further ten.

All the girls required fillings in their teeth. The average DMF rate was 14.15. Existing fillings numbered 454, and 439 new fillings were required.

Pickerill (1912), in a study of 260 Maori skulls, found that only two contained carious teeth (0.76 per cent). The ancient Maori was the most caries-immune race for which statistics are available. In 50 Maoris living under civilized conditions, Pickerill found that 98 per cent had decayed teeth.

Nutrition

Dental survey of selected Thai children: nutritional observations

Od Kridakara, Rith Boozayaangool, Isra Yuktananda and J. F. Volker. *Am.J.Clin.Nutrit.* 4:280-284 May-June 1956

Over 2,000 Thai school children from 4 to 18 years old were given dental examinations. Observations were made of caries prevalence, gingival health and occlusion. Dental caries experience was recorded in terms of DF (decayed and filled teeth). Although only 8 per cent of the 552 Bangkok children were free of caries, 55 per cent of the 673 Chiangmai children and 38 per cent of the 652 Lampang children had not experienced tooth decay. The prevalence of caries in Bangkok at any age from 5 to 18 years is much greater than that observed in Chiangmai. The average child in Chiangmai has a deciduous DF rate of slightly less than 3 at six years of age, and his Bangkok counterpart has a DF rate of about 10. At age 18, when Chiangmai school children have an average DF of 1.5, Bangkok school children have a DF of 5.5. In general the caries attack rate in Lampang children parallels that found in Chiangmai.

In no instance does the percentage of children with normal gingiva reach 50 per cent. The overall gingival health of the Chiangmai children was poorer than that of the Lampang and Bangkok children. A considerable number of the Chiangmai children showed evidences of dietary deficiencies. Cheilosis and tongue symptoms were commonly seen.

In general, the occlusion of the Chiangmai children was superior to that of the Bangkok children. About 60 per cent of the Chiangmai children had normal occlusion, whereas only 15 per cent could be classified as being poor. Only 43 per cent of the Bangkok children had normal occlusion and 24 per cent had poor occlusion.

A possible explanation for the very high caries prevalence among Bangkok children is that in Bangkok the basic Thai diet of rice, fruit and

fish has been replaced in part or supplemented by sugar and starch-containing foods and confections. From 1945 through 1949 sugar consumption increased by about 400 per cent, and wheat flour utilization increased from 100 metric tons to over 10,000 tons.

There is a great need for dental services throughout Thailand. In Lampang, 850 unrestored carious teeth were observed and only one restoration was noted in the 652 children examined. In Bangkok, 552 children had 2,183 teeth needing restoration; only 242 carious teeth had been restored.



Dental health education

Minnesota dental program

Henry E. Colby. *North-West Den.* 35:155-156
May 1956

For the dental profession, dental decay and its crippling effects constitute just as large a problem as do cancer and the common cold for the medical profession. Dentistry, however, does not receive the generous financial aid from philanthropic foundations or the government that is made available for scientific research in other fields. The Minnesota State Dental Association, with its limited funds and utilizing voluntary personnel, for several years has carried out a five-point program to improve the dental health of children of school age. The program embraces dental health education, fluoridation of communal water supplies, free cavity-detection roentgenograms at the Minnesota State Fair, the substitution by school authorities of fresh fruits, milk and fruit juices for candy bars and soft drinks in school lunch rooms, and the use of excusal request blanks to have children excused from class work for dental appointments.

The association has sponsored many dental health conferences for youth leaders throughout the state. In the larger cities employing school dental hygienists, the improvement in oral hygiene has been gratifying.

During National Children's Dental Health Week in February 1956, appropriate programs were presented in many of the schools throughout the state. Most of the radio and television stations throughout the state presented dental programs. In St. Paul members of the dental society's speakers bureau appeared before the students of each school to discuss dental health. In many Minnesota communities, poster contests were used to stimulate children to better dental health.

In Minnesota about 40 municipalities now afford their children the simple, effective protection against dental decay provided by fluoridation of community water supplies. Today about 445,000 Minnesotans are drinking fluoridated water.

For the past two years the Minnesota State Dental Association has conducted a free cavity-detection roentgenographic clinic at its exhibit at the State Fair. Last year 3,000 visitors from 5 to 20 years old presented themselves for examination. The roentgenograms were mailed to the family dentist for the diagnosis of existing dental defects.



Public health dentistry

Dental missionary tells of Africa

Baylor D.J. 6:11-13 Spring 1956

Wayne Logan, a 1950 graduate of the Baylor University College of Dentistry, served as a dental missionary at the Baptist Mission in Nigeria from 1952 to 1955. Nigeria, a country on the west coast of Africa, is a little larger than the combined area of Texas and Oklahoma and has a population of over 30,000,000 people.

Medical missionary work was started in Africa in 1900, and the dental program began in 1940. The medical-dental staff presently includes 10 physicians, 2 dentists, 12 to 14 nurses, a pharmacist, a laboratory technician and a hospital administrator. The need for additional dental missionaries is great. Ibadan, a city of 500,000 persons, has only two missionary dentists and two government dentists. The healing arts are

used to gain the confidence of the natives and establish their interest in the Christian religion.

Before the coming of dentists to Nigeria, the teeth of the natives were extracted by village blacksmiths. The Nigerian native dreads the loss of teeth as indicative of old age. The native is always delighted with artificial dentures and wears them enthusiastically.

The incidence of caries is about 1 per cent, but the incidence of periodontal disease among the natives is as high as 70 per cent. The natives eat no refined carbohydrates, their only sweets being pawpaws, pineapples and oranges. Vegetables are abundant during the six month's growing season; dried corn and potatoes form the nucleus of the diet in the remaining six months. There is little meat, and the diet is deficient in proteins. Milk is not drunk, but children are nursed until the age of three years.

The dental needs in the 11 leper colonies of Nigeria are cared for by the dental missionaries. With modern drugs, many instances of advanced leprosy can be arrested or retarded. Those in the early stages of the disease may be cured within a year. Each year about 100 lepers are discharged as cured.

Riverdale preschool dental project

Frank Compton. *J.Ontario D.A.* 33:28-29
April 1956

The foundation of dental health is laid early in life. The Toronto East Dental Association and the Department of Public Health jointly formulated a pilot plan for the Riverdale district designed to mobilize in that area resources and personnel for a program of examination, education and preventive care for preschool children.

The project was launched in September 1955. A dental hygiene team consisting of a dental hygienist, dental assistant and clerical assistant works under the direction of a public health dentist, and cooperates with public health nurses, doctors and district dental practitioners. The dental hygiene team visits each of the five district health center substations to which preschool children are brought for health supervision. These children now also receive a dental

examination. Parents are interviewed and given the names and addresses of dentists practicing in the neighborhood. The children requiring treatment are given a preschool dental postcard to be signed by the family dentist on completion of treatment. It is hoped eventually to provide topical applications of sodium fluoride to the teeth of those children who have completed dental treatment or who require no reparative treatment.

Dental health teaching projects have been launched in several kindergarten classes. The preschool dental examination program has been explained to parent-teachers' associations. The effectiveness of the program will be evaluated over the three year period for which the project is scheduled. The ultimate success of the program depends on the extent to which parents of preschool children will use the services offered.

Dental health in perspective

Lloyd F. Richards. *J.South. California D.A.*
24:28-32 June 1956

The story of dental health is written in terms of man's lack of it, his continuous search for relief from dental pain and disease, and his attempt to repair the damage caused by dental disease. Petrified skulls of cave men who lived 22,000 years ago show that they suffered from dental disease. Mankind through the ages to the present time has seldom been free of the torment of dental disease.

The demand of the people for dental services established the practice of dentistry. In the eighteenth century men with scientific curiosity began to investigate the causes of dental disease. The nineteenth century brought great progress in the dental field.

In the first half of this century dental public health has grown as a recognized specialty of dentistry. The early emphasis was on dental treatment, but it was soon realized that the backlog of need for dental care could not be met unless some dental disease was prevented. The emphasis in dental public health programming swung from treatment to education, prevention and care.

More dentists will not solve the dental health problem. Dental facilities must be used more effectively and people must be taught not to neglect their dental health. Less than a fourth as much

time is required for a dentist to maintain a mouth in a healthy condition as is required to restore a neglected mouth to health.

Much dental disease can be prevented by proper toothbrushing, proper diet and nutrition, and the fluoridation of public water supplies. Fluoridation, one of the greatest dental public health measures known today, is the only method for the prevention of tooth decay available to all regardless of religion, race or economic status, one which requires no effort on the part of the individual other than drinking water. Its safety, economy and benefits have been proved beyond any reasonable doubt by over 20 years of scientific research and field studies.

The dental health problem increases in proportion to population increases. In California it is estimated there are 49,000,000 decayed or missing teeth in the 4,500,000 children of school age. These teeth need immediate care or replacement. In 1965 it is estimated there will be 70,000,000 teeth of California school children requiring attention. The increase in the number of dentists cannot keep pace with the increase in population. Future dental health problems will be tremendous; they can be resolved only through the knowledge, the research, the attitude and proficiency of the dental profession, the methods of prevention, and the resources for education and community organization.

People no longer need fear dental pain, nor need have their beauty marred by ugly, decayed teeth, nor need be crippled by the loss of teeth. People can look forward to a time when dental disease is the exception.

The health of the elderly at home

W. Hobson and J. Pemberton. *Brit.M.J.*
No. 4967:587-593 March 17, 1956

A survey was carried out in Sheffield in the years 1949 to 1951 to investigate and describe the state of health and the diets of elderly people living at home, to examine the relation between health and such factors as age, sex, marital state, social class and diet, and to collect information on normal physiologic standards in the elderly. There were 476 persons in the sample—192 men aged

66 or over and 284 women aged 61 or over.

"The dental examinations revealed that only a tiny fraction of this group of the elderly had adequate natural dentitions. Approximately a quarter of the sample depended on their gums alone or on a few remaining teeth or stumps, more often than not carious, for mastication. The dentures of many of those who used them required replacement or repair. The dental condition of this group can only be regarded as thoroughly unsatisfactory. They were of a generation that had little or no access to conservative dental treatment and who came to regard complete dental clearance in middle age as a normal event. It is probable, in view of the relatively recent development of the dental profession, that few of these elderly people had had the benefit of treatment in their childhood or early adult life from trained dental surgeons. The fact that the average number of surviving natural teeth was significantly higher in the upper social class group and that there was less caries in them suggests that better dental treatment might considerably reduce the proportion of the elderly who depend on artificial teeth or no teeth at all for mastication."

Application of public health methods to the problems associated with periodontal diseases

J. M. Wisan and D. Walter Cohen. *Bul.Am. A.Pub.Health Den.* 16:1-12 May 1956

The American Public Health Association adopted a resolution at its 1954 meeting predicting that "the control of periodontal disease represents the next major activity of dental public health."

Periodontal treatment embraces the elimination of the etiologic factors, elimination of pockets, restoration of the physiological gingival architecture, effecting a harmonious functional occlusion, and the maintenance of periodontal health by means of oral physiotherapy. Treatment requires considerable chair time and careful attention by the dentist. Because of the wide prevalence of periodontal disease, it is almost an impossible task for community agencies to treat and control all affected mouths. A program of prevention is necessary. Unfortunately, the pres-

ent known methods of prevention leave much to be desired. No preventive measures have been discovered which are effective in large groups of patients, as is fluoridation of communal water supplies for dental caries. The known preventive measures require regular, skillful and individual attention by a dentist, and daily care by the patient. The greatest need in the field of periodontology is the determination and utilization of more effective preventive and control measures.

The Dental Health Section of the Philadelphia Department of Health has requested the Philadelphia Society of Periodontology to cooperate in reviewing present-day knowledge of periodontal disease. The Council of Dental Health of the Philadelphia County Dental Society has agreed to accept the leadership in coordinating community agencies to organize an active program. The following projects are contemplated: (1) a poll of dentists on their opinions and practices relating to periodontal diseases; (2) a poll among lay persons to develop information about their concepts of periodontal diseases; (3) a survey of periodontal conditions in Philadelphia, in which Russell's system of scoring will be used; (4) educational programs to be developed by several community agencies; (5) postgraduate and refresher courses for local dentists on periodontal treatment, and (6) studies of the feasibility of community treatment programs.



School dentistry

Progress in school dental health education

Perry Sandell. *J.School Health* 26:67-72
Feb. 1956

In 1955 the Bureau of Economic Research and Statistics of the American Dental Association made a study to determine the number of cities having school dental programs and the characteristics of these programs. Questionnaires were sent to superintendents of public schools in 3,529 cities of more than 2,500 population. A school health program was defined as any program con-

ducted through the school utilizing the services of dentists, dental hygienists or dental assistants. Completed questionnaires were received from 2,228 cities, of which 1,343 (60.3 per cent) reported the operation of school dental programs.

The larger the city, the more likely it is to have a dental program. Of the cities of 2,500 to 5,000 population, however, 47.4 per cent of those responding reported dental programs.

Ninety-five school systems (7.1 per cent) had the services of a full-time dentist, but of all the full-time dentists, about two thirds (68 per cent) were actually employed and their salaries paid by the health department. Only 20.9 per cent were employed and paid by the school system.

Full-time dental hygienists were employed in 297 (22.1 per cent) of the school systems reporting programs. More than two thirds (67.6 per cent) of the hygienists were employed and paid by the school.

In 83 per cent of the cities, dentists worked part-time in the schools. Of all the dentists working part-time, 43 per cent donated their services. The others were paid either by the school, the health department or under other arrangements.

Only 11.7 per cent of the schools reported dental hygienists employed on a part-time basis. Of the part-time hygienists, about an equal number were paid by the school, the health department and through other arrangements. About a fourth of the hygienists donated their services.

Almost three fourths of the cities with school dental health programs reported that mouth examinations by dentists were a part of the health program. Twenty-five per cent reported annual examinations for all pupils; 38 per cent had annual examinations for certain grades only, and 10 per cent reported examinations at irregular intervals.

Some 76 per cent of the cities provided all or some of their school dental services in the school buildings, and 21 per cent referred pupils on the completion of their dental examination to their own dentists for a more complete examination.

Some dental treatment was provided by dentists in 60 per cent of the school systems. Such treatment was usually performed for the underprivileged children only. Ten per cent of the cities reported providing such services as fillings and extractions for all requesting these services.

Miscellaneous

Tennessee fluoridation opinion survey

Carl L. Sebelius. *J. Tennessee D.A.* 36:159-161
April 1956

Occasionally a few outspoken opponents of fluoridation have inferred that members of the dental profession have taken no positive stand in favor of the merits of water fluoridation.

In February 1956 a post card survey was made on the subject of fluoridation. Of 1,028 cards mailed to members of the Tennessee State Dental Association, 732 were returned. Seven hundred dentists indicated they favored the fluoridation of public water supplies because of the scientific evidence regarding its merits; 27 dentists stated they felt there was insufficient scientific information and therefore they opposed fluoridation. Cards were received from 115 communities in Tennessee and from 29 areas outside Tennessee.

Facial injuries: a common denominator of automobile casualties

Jacob Kulowski. *J.A.D.A.* 53:32-37
July 1956

In a series of 661 automobile casualty survivors treated in the Missouri Methodist Hospital from late in 1949 through 1954, 295 persons, or 45 per cent, received varying degrees of facial injuries as distinguished from injuries of the head. Of 163 men and 132 women involved, 100 men and 21 women were in the driver's seat; 35 men and 65 women were front seat passengers, and 10 men and 17 women were rear seat passengers. The seating position was unknown for 22 men and 19 women.

The types of lesions received by the 295 automobile casualty survivors who had facial injuries

were as follows: lacerative, 54 per cent (203); contusive and abrasive, 24 per cent (91), and fracture, 22 per cent (80). A number of these people had injuries of all kinds.

The frequency rates of involvement of the three principal levels of the face were as follows: upper third, 33 per cent (109); middle third, 53 per cent (175), and lower third, 14 per cent (49).

Lacerations of the lips were noted in 27 persons. Exclusive of complicating tooth injuries, intraoral lacerations occurred in 12 persons; the uvula and tongue were each cut once, respectively.

The vulnerability of the middle third of the face to skeletal injuries is shown by the following figures. In 118 fractures, the upper third was involved in seven instances (frontal bones); the middle third in 62 (nasal bones, 26; zygoma, 22, and maxilla, 14); and the lower third (mandible) in 30. In 19 persons, teeth were involved. Several of these fractures were bilateral, usually those involving the mandible. There were three nasal, one maxillary and two mandibular compound fractures. Undoubtedly, there were more of these in the mandible. Teeth were driven into the maxillary sinus in only one instance; more teeth, however, were otherwise injured or lost subsequently.

The occurrence of fractures distributed according to the seating position of those injured is as follows: of 121 in the driver's seat, 37 (31 per cent) sustained fractures; of 96 front seat passengers, 18 (19 per cent), and of 27 rear seat passengers, 9.

In larger series with epidemiologic significance, the back seat always proves to be the safest one in the car. Drivers are especially apt to receive facial injuries from impact with the steering controls. Right front seat passengers are similarly vulnerable to head injuries.

From the standpoint of the dentist and physician, it would seem that the attention of the safety engineer has been focused on the prevention of injuries to the head when facial structures should be getting more attention.

Periodontics and endodontics



Periodontics

Treatment of the intrabony pocket

Herbert I. Oshrain. *New York J. Den.* 26:106-109
March 1956

Periodontal pockets generally fall into two categories, gingival and intrabony. The base of the gingival pocket lies coronal to the bone crest, whereas in the intrabony pocket the base is apical to the bone crest. Treatment of the intrabony pocket presents three alternatives: extraction of the tooth, resection of the bone coronal to the base of the pocket, or therapy based on the possibility of reattachment.

The intrabony pocket offers a greater opportunity for success in an attempt at reattachment than does the gingival pocket. Prognosis will depend on the shape of the pocket, accessibility, visibility, and the possibility of eliminating the etiologic factors associated with the lesion.

Therapy is carried out by means of a flap operation, gingivectomy or subgingival curettage. All rest on the following basic principles:

1. The epithelium lining the lateral aspect of the pocket must be removed.

2. The epithelial attachment must be removed.
3. Epithelium at the free margin of the gingiva should be removed, so that a rapid downgrowth of epithelium will not interfere with the connective tissue reattachment being sought.
4. The tooth surface must be freed of calculus and all soft necrotic cementum removed.
5. The integrity of the blood clot must be maintained.

Gingivectomy and subgingival curettage are performed. Since mobility of the tooth may disturb the adjacent blood clot, mobile teeth should be stabilized before the operation is begun. When the operation has been completed, the field of operation should be irrigated with warm water to insure removal of any loose particles of tissue or calculus. Sufficient time is allowed for a clot to form and the clot is protected by placing a strip of adhesive foil over the operated region. A periodontal pack is placed over this foil, and an-



Figure 2 Left: Note intrabony pocket on the distal side of cuspid. Right: One year later; stabilization has been achieved by fixed splinting

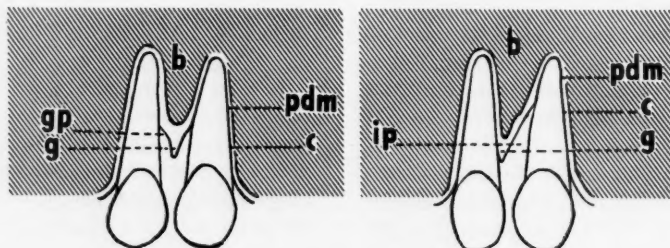


Figure 1 Left: Gingival pocket. Right: Intrabony pocket. (b—bone, g—gingiva, gp—gingival pocket, c—cementum, pdm—periodontal membrane, ip—intrabony pocket)

other layer of foil covers the teeth and pack. This dressing is kept in place for one week, removed, and the region is cleansed but not probed. After several weeks the region may be probed to determine closure or nonclosure.

Usually six months to a year must elapse before there is roentgenographic evidence of restored alveolar bone. A successful operation is indicated by the following: attachment of new periodontal membrane fibers to the tooth surface; establishment of epithelial attachment at a more coronal level, and restoration of the lateral aspect of the interdental bony septum.

Gingivitis: diagnosis, etiology and therapy

M. W. Houglum. *Minneap. Dist. D.J.* 40:22-25
June 1956

The dentist cannot confine his efforts to restoring teeth to usefulness and function, or substituting for teeth already missing. He also must include the supporting structures of the teeth in treatment planning. Every dentist must be a periodontist.

The "normal" gingiva is pink; the marginal contour is thin; the knifelike edge envelops the neck of the tooth in a tight, collarlike fashion; the papillary contour is flat, terminating directly below the contact point in a thin, rounded tip. The texture of the healthy gingiva is stippled or pebble-grained. The consistency is firm and resilient; probing elicits no hemorrhage. The alveolar crest extends coronally at least seven-eighths of the root length; this crest height is subject to atrophy with advancing age, but rarely will less than five-eighths of the root be embedded in the bony alveolus unless periodontitis or occlusal trauma has intervened.

The earliest clinical symptoms of periodontal disease are marginal inflammation, edema and easy bleeding. The cause is most frequently calculus. Other local factors contributing to gingivitis include the following: overhanging margins of fillings, gingival caries, overextended margins on crowns and porcelain jacket crowns, open contacts, ill-fitting partial appliances, malaligned teeth, poor oral hygiene, malocclusion, traumatic occlusion, mouth breathing, and habits such as

finger nail biting and pencil biting. The removal of the local irritant usually results in an immediate recovery of the gingiva.

The treatment of gingivitis is relatively simple. Basically it consists of the removal of the calculus or other local factor, instructions to the patient in home care of the mouth, and the correction of any occlusal disharmonies.

Tooth mobility is usually the result of either inflammation, trauma or bone loss. Frequently with the alleviation of the inflammation by instrumentation the appearance of the gingiva improves and there is a reduction in the degree of tooth mobility. Elimination of trauma by selective grinding often reduces mobility. If bone loss is pronounced, the weakened teeth may be stabilized by continuous Vitallium splints, onlay bridges or interproximal wiring.

A deep rose or magenta hue to the gingival tissue may indicate deep periodontal involvement. The first evidence of periodontal disease is the fading out of the lamina dura interproximally from across the alveolar crest. As the disease advances the interdental septa begin to fade and become fuzzy, gradually assuming an indistinct, moth-eaten appearance.

Should gingival inflammation persist after all local causes have been eliminated and the patient's home care has been established as adequate, systemic causes should be suspected—nutritional or vitamin deficiencies, gastrointestinal disease, blood dyscrasias and endocrine maladjustments, for instance.

Most dental patients can be relied on to be cooperative when they have been informed of their gingival condition and advised that unless treatment is instituted the gingivitis will lead eventually to loss of their teeth.

Pyorrhea

Consumer Reports 21:240-243 May 1956

Although loss of teeth is not an inevitable concomitant of aging, about one out of every five Americans has lost all his teeth by the time he turns 40; at age 60, the ratio is two out of five, and at 70, three out of every four have lost all their teeth.

In adults past 35, periodontal disease is the most common cause of the loss of teeth. Periodontal disease can be caused by any condition that irritates the gums, weakens their resistance to disease, or places unusual stress on the supporting structures of the teeth.

A great deal of periodontal disease could be averted. If dental decay could be reduced by the fluoridation of the water supply, proper tooth-brushing practices, proper and timely dental treatment from early childhood, and reasonably balanced diet, many of the factors which predispose the individual to periodontal disease could be eliminated. Early detection of cavities to prevent loss of teeth and the serious derangement of occlusion to which it may lead, is of primary importance. Early orthodontic treatment, where needed to correct malocclusion from whatever cause, is necessary for the normal functioning of the teeth. Everything possible should be done for the child so that he enters adult life with a normal, healthy mouth, and with all his teeth in good function. This is the best insurance against periodontal disease later in life.

Objective periodontal recording methods.

1. Stabilizing the patient's position

for precision measurements (Objektiva parodontala registreringsmetoder. I. Fixering av patient för precisionsmätningar)

Claes Lundqvist, Gunnar Johanson and Hans-Ebbe Levin. *Odont.Revy* 6:327-343 Dec. 1955

Precision measurements of technical details usually require a definite orientation and fixation of the object to be measured. The same principle must be adhered to for measurements of teeth and surrounding tissues: the relative position of measuring instrument and object must be known and reproducible. Increased precision in measurements of periodontal dimensions and movements or changes of dimension is essential in order to obtain quantitative data concerning symptoms, pathologic changes and the effect of various therapeutic methods. Such quantitative data would make it possible to express the symptoms and changes in figures which would in turn yield themselves to statistical analysis. Increased re-

quirements of precision in measurements, however, lead to correspondingly increased need for the stabilization of the position of the patient.

The stability of the patient's position when the head was fixed by means of self-curing acrylic splints attached to an examination table was studied. An electric displacement pickup was used to establish the stability of the jaws in relation to a measuring device in front of the patient. The degree of fixation was determined under various conditions in ventrodorsal, craniocaudal and lateral directions. The stability of the position was also measured when the head was fixed by means of a cephalostat.

Five patients with normal gingival tissue and teeth and five patients with serious periodontal disturbances including deep gingival pockets and pathologic mobility of the teeth were used for the measurements of patient fixation over ten-second intervals.

Dental splints covering bicuspid and molars only allow fixation of the jaws for ten seconds with a standard deviation of movement of less than 15 microns in all directions. Greatest stability is reached in ventrodorsal and lateral directions where the standard deviation is less than 10 microns. The fixation obtained for patients affected with periodontal disease is equal to that obtained for normal patients having the same number of supporting teeth in bicuspid and molar regions.

In ventrodorsal and lateral directions the stability is slightly greater for the lower than for the upper jaw. Two supporting teeth on each side of both jaws result in stabilization equal to that obtained with four supporting teeth on each side of both jaws.

The positioning of a patient in a cephalostat allows a degree of stability with standard deviation of movement of 70 microns or less. The stability of the jaws in a dental splint is about five times greater in ventrodorsal and craniocaudal directions and more than 20 times greater in lateral direction than in the cephalostat.

The fixation of the head by means of dental splints is particularly suitable for different clinical precision measurements of the periodontium. It may also be of value for anthropological, ophthalmological and surgical measurements of structures in the head.

Bone-grafts in periodontal disease: a preliminary report

W. G. Cross. *D.Practitioner* 6:98-101 Nov. 1955

Bone grafting, because of the peculiar topographic features of the alveolus and the difficulty of avoiding infection, has not been utilized to replace alveolus lost as a result of periodontal diseases.

Under favorable circumstances a measure of bone regeneration can occur. Many individuals have demonstrated the reformation of interdental bone to a more coronal level, often with reformation of a lamina dura. This bone regeneration is commonly seen after the successful treatment of the periodontal abscess, and after curettage of the intrabony pocket, especially the narrow-mouthed variety. Where the pocket is wide-mouthed, the chance of bone regeneration occurring is slender.

Since March 1952 the author has carried out 13 separate bone grafts for patients with intrabony pockets involving anterior teeth. For a graft to succeed, the following are essential: (1) a clean, noninflamed operative field; (2) minimal mobility of the teeth concerned, and (3) avoidance of postoperative infection.

The pockets are curetted in order to remove all deposits on the root surface, granulations and pocket epithelium. If the tooth is mobile it must be splinted and the occlusion corrected at the same time. The graft proper may take place two weeks later, providing there is no clinical evidence of inflammation or suppuration.

The operation is carried out under local analgesia and 300,000 units of procaine penicillin are administered intramuscularly. Whether a flap is raised, or whether the graft can be inserted without this, will depend on the accessibility of the deepest recesses of the pocket. The whole region is re-curetted with sharp hoes or curets to remove all cementum and with curets to remove any pocket epithelium which has reformed. The region is now ready for the graft to be positioned.

Two days before the operation, a suitable portion of bone is selected from the bone bank, thawed and left for 24 hours in a penicillin-streptomycin solution. The bone to be grafted is then placed on a sterile towel, and small fragments of spongiosa are dissected away from it

and placed on one side. The fragments should be small and several in number. They are gently placed into the intrabony pocket and built up until the desired bone height is achieved. The pocket should be underpacked rather than overpacked, as the blood clot which forms as a result of the curettage will shrink somewhat, and in doing so the topmost fragment may become exposed. A suitable protective dressing is placed over the region. Tin foil is adapted so as to cover the gingival margin, part of the crown and the interdental papilla, with a space left above the foil into which a standard gingivectomy pack can be placed. The patient is given a note for the physician requesting daily administrations of intramuscular procaine penicillin for a further three days, and the pack is removed at the end of a week, after which the patient may brush the region cautiously with a soft brush, and after a fortnight commence the careful use of interdental stimulators. The former pocket should not be explored for at least a month.

This work is only preliminary. Some measure of success is apparent, but over-optimistic conclusions cannot be drawn from the 13 patients so far treated.

On tooth mobility (Om tandernas rörlighet)

A. Forsberg and G. Hägglund. *Sveriges tandläk. förb.Tidn.* 47:665-672 Dec. 1955

Information about tooth mobility is important for the evaluation of periodontal diagnosis and prognosis. It has been customary to determine tooth mobility by moving the tooth in a labiolingual direction, holding on to the tooth with two fingers. The mobility is then recorded according to a rather subjective evaluation and expressed as various degrees of mobility.

The reproducibility of this method is poor and it is debatable whether it is of any value for clinical use. Particularly for research purposes, a considerably more exacting method must be used, and several types of equipment designed for such determinations are described.

A modification of Mühlemann's method involved the use of a dial micrometer attached to a holder mounted on a partial impression tray. The

tray was attached to the posterior teeth with impression compound and the dial micrometer was brought in contact with the labial surface near the center of the incisal part of the buccal surface. Load was applied using a dynamometer permitting controlled loading from the lingual and labial surfaces. The mobility was recorded for various anterior teeth under labial and lingual loads from 100 to 600 Gm. The possible sources of experimental error were evaluated and the reproducibility of the method established by statistical analysis of the results. It was found that an increasing load resulted in decreasing standard deviations. Some differences in the results obtained as compared with the results of Mühlemann were found.

After the method had been critically evaluated, 40 maxillary incisors in ten men and ten women, 18 to 19 years old, were tested for mobility under various loads.

All teeth examined had clinically and roentgenographically sound periodontal tissues. Average values are presented graphically. The mobility of central and lateral incisors was approximately the same. The mobility in a labial direction was two to three times as great as the mobility in a lingual direction. The mobility was somewhat greater in women than in men. The labial mobility curves are rather steep for loads up to 200 Gm., after which the slope decreases sharply.

A load of 600 Gm. seems to be the most feasible value in most instances.

Tartar on an impacted tooth? (Tártaro en un diente retenido?)

Alejandro Brero and Jorge M. Pelizzari.
Agrup.odont. 12:394-395 Jan.-March 1956

A 46 year old man came for treatment because of swelling in the lower left third molar region. On palpation the soft tissues were nonadherent to a hard underlying mass. Roentgenographic examination of this tumor indicated that it was a third molar, with two roots, in mesial subgingival impaction.

Under block anesthesia the incision of soft tissues revealed the tooth covered by a hard dark substance which adhered firmly to the enamel.

After removal of the molar it was decided that this deposit was calcified material, with all the characteristics of subgingival calculus.

The question is, How can calculus appear on a dental surface totally enclosed and lacking any communication with the oral cavity?

The primary function of all epithelial tissues is to secrete. Under certain conditions they can produce calcified substances, such as the eggshell of birds and the enamel of teeth.

When there is a pathologic modification of the normal epithelial secretory function, the basal cells elaborate organic calcium. Examples of this pathologic alteration are biliary, renal and salivary calculus, as well as subgingival calculus.

Iontophoresis as an equalizing factor in bone development and resorption (Die ionophoretische Therapie als Faktor des funktionellen Belastungsausgleiches)

Juray Kallay, Zagreb, Yugoslavia.
Parodontol., Zürich 9:149-155 Dec. 1955

In the treatment of periodontal diseases, many methods, some local and others general, are utilized. The reason for the different treatment techniques is based on the different etiologic factors.

Periodontal diseases are chronic suppurative inflammations of the periodontal membrane and the margins surrounding the teeth. Such pathologic changes can be caused by degeneration and devitalization of the pulp, progressive degenerative disturbances of the periodontium or traumatic injuries which produce occlusion of blood vessels at the tooth apex and lead to necrosis or infection of the pulp. Dental caries or a subsequent bacterial invasion may also cause these or similar symptoms.

Hereditary and constitutional factors often are exciting causes of periodontosis. The hereditary characteristics in the third generation, however, often are changed (grandmother and mother afflicted with the disease, the sons free of it). Probably, other dominant characteristics (the different constitution of the father) play an important part both positively and negatively.

In hereditary, constitutional periodontosis, the primary symptom is an osseous rarefaction ac-

accompanied by a simultaneous or subsequent recession of the gingiva. All other symptoms such as inflammatory alterations, pocket formation and suppuration are secondary. This type of periodontitis is termed (by the author) "malign progressive periodontitis," and should be differentiated from "secondary periodontitis."

Periodontal disease is closely related to severe disturbances in the equilibrium between bone growth and resorption. This equilibrium is controlled by endocrine, nutritional and local functional factors.

In addition to the generally used treatment, iontophoresis can be an essential part of treatment. It can be used to normalize the function of osteoblasts, to reduce their proliferation, to mineralize osseous tissues and to improve the local blood circulation.

Before starting iontophoretic treatment, however, local examinations are necessary to determine whether diabetes mellitus is present and to discover instances in which the pocket formation has reached deeper strata or is accompanied by severe suppuration. In all these instances, the utilization of iontophoresis is contraindicated.

The immediate result of iontophoretic treatment is the desensitization of the hypersensitive necks of the teeth and the stabilization of loose teeth or of the whole tooth row. After iontophoresis, the loosening process is neutralized, and the teeth will remain in position for years.

Periodontal diseases and campaigns of social education (Las enfermedades parodontales y las campanas de educacion social)

P. Ayllón. *Odontoiatria, Madrid* 12:445-446
No. 140 (8) 1955

Periodontosis and gingivitis are symptoms of faulty nutrition, avitaminosis, lack of proteins and minerals in the diet, and either hereditary or acquired neuroglandular disorders. These conditions are divided into the following four classes: (1) inflammation and simple infection of the gingival mucosa; (2) chronic inflammation of the mucosa and of the alveolar bone (benign periodontosis or pyorrhea alveolaris); (3) degeneration of the alveolar bone, and (4) tissue lesion caused by

occlusal trauma. All follow a progressive course until finally expulsion of the teeth occurs. Crusades for social education of the people and for treatment of the diseases should be organized. They should be sponsored by social centers and dentists.

Statistics published recently by Camino indicated that 244 patients cared for in city hospitals or as ambulatory patients for diseases other than dental ones were observed from the dental standpoint also. Of these patients, 121 had periodontal lesions. The lesions were of Class 1 in 92 per cent, of Class 2 in 4 per cent and of Class 3 in 3.5 per cent. Of the patients with periodontal diseases, 48 were men and 73, women. The periodontal lesions were of Class 1 in 91 per cent of the men, of Class 2 in 4 per cent and of Class 3 in 4 per cent. They were of Class 1 in 92 per cent of the women, of Class 2 in 4 per cent and of Class 3 in 4 per cent. Diseases of Class 4 due to occlusal trauma were observed in 104 of the 131 persons who were examined (80 per cent).

On the basis of these statistics, Class 1 diseases are the most frequent in both men and women. The causes of these diseases are lack of oral hygiene, nutritional deficiencies and, in women, hepato-ovarian disorders. Pyorrhea alveolaris or Class 2 periodontosis is more common in well-to-do persons (or those who lead a sedentary life or who worry) than in those of moderate means. Dental abnormalities and disorders of occlusion are more common in the last-mentioned group of people.

Experimentally produced periodontitis and the provocative method used

(Eksperimentalnyi amfodontos-parodontos i metody ego vosproisvedeniia)

S. A. Nikitin. *Stomat., Moscow* 6:3-11
Nov.-Dec. 1955

The staff of the Dental Institute of the University of Odessa recently undertook animal experiments to establish whether periodontitis can be produced artificially.

Cats, which have a tendency toward all forms of periodontal disease, were used in this experiment.

After surgical removal of the nasal and the submaxillary ganglion, and after splenectomy, several symptoms, all typical of periodontosis, appeared. The pathologic phenomena were observed mainly in the lower anterior region. Atrophy of the interalveolar septum and enlargement of the periodontium occurred. Vascular alterations were numerous and varied in the same animal as well as in different animals. Dilation of the vascular system in the periodontium and in the alveolar process was observed. Two preliminary pathologic alterations were visible in gingival pockets—atrophy and inflammation.

After removal of the nasal ganglion only, eight cats showed only insignificant changes in the vascular system, but in two cats a progressive alteration in the periodontium occurred. The animal experiment proves that, by additional surgery, additional pathologic symptoms of periodontosis can be produced.

The reaction of the tissues to the different surgical interventions was dissimilar in individual cats. It must be assumed that dispositional factors play an important etiologic part in the intensity of the experimentally produced periodontal disease. Such dispositional factors are (1) traumatic neurosis; (2) apical, focal or secondary infection; (3) avitaminosis, and (4) hypofunction of the vascular system of the periodontium.

In all tests, the preliminary symptoms were dominant, therefore periodontosis can be classified as a form of polyneuropathy. This conclusion could be valuable in the diagnosis, therapy and prognosis of periodontosis.

Mouth hygiene habits and their relation to periodontal disease

M. K. Sanjana, F. S. Mehta, R. H. Doctor and M. A. Barretto. *J.D.Res.* 35:645-647 Aug. 1956

An incidence of 83.2 per cent of "generalized periodontal disease" was found among 1,455 residents of Bombay, India. The incidence increased with age. The 1,445 men and women examined were between 16 and 50 years of age and were in the same general economic group, earning 80 to 100 rupees a month. They were all

relatively healthy as judged by ability to carry on normal day-to-day work. Persons with missing teeth, other than third molars, were not included.

Most of the persons examined used tobacco on the finger as an oral hygiene aid. Among the 248 toothbrush users no difference in effect was evident between the employment of tooth paste and tooth powder. Among the 1,007 finger users the use of charcoal, tooth powder or tobacco as aids did not seem to affect the incidence of disease. The occurrence of periodontal disease, however, was more common in the posterior segments of the mouths of finger tobacco users than in those using the finger with tooth powder or charcoal.

The incidence of generalized periodontal disease did not appear to be affected by the method of oral hygiene but increased with age regardless of the oral hygiene method used.



Endodontics

Comparative study of methods for closure of exposed pulp with methylcellulose-calcium hydroxide or with human dentin with sulfathiazol (Estudio comparativo de recubrimientos pulpaes a base de hidróxido de calciometil celulosa y dentina humana con sulfatiazol)

D. Escobar M., J. Lamprea O., V. Ortega N. and others. *Rev.Fed.odont.Colombiana* 7:225-227 Jan.-Feb. 1956

Either methylcellulose calcium hydroxide or human dentin used for the closure of exposed pulp results in the formation of secondary dentin and in definitive healing of the exposed region and recuperation of the involved tooth. Thirty-eight patients between the ages of 15 and 35 years sought treatment for exposure of the dental pulp. The preparation used was either a commercial paste consisting of methylcellulose and calcium hydroxide or a paste prepared by the authors with sterilized human dentin in a 10 per cent sulfathiazol ointment.

Prior to the treatment, a periapical roentgenogram was taken and the electric sensitivity of the exposed pulp was measured with Burton's vitality test. For application of the treatment the following requirements are necessary: (1) the exposed area of pulp should not exceed 1 mm. and it should be hypersensitive to touch; (2) all carious tissue should be removed; (3) symptoms of pulpitis should not be present, and (4) the age and general condition of the patient should be satisfactory.

Routine preparation includes sterilization of instruments and thorough asepsis of the field of operation.

The technic for the application of methylcellulose calcium hydroxide is as follows: (1) the operative field is isolated with a rubber dam; (2) particles of carious dentin are eliminated with Black's scoops or with large round burs, making the lathe rotate in a contrary motion; (3) hemorrhage, if it occurs, is controlled by application of a 1:1,000 epinephrine solution; (4) the cavity is sterilized with monochlorophenol, which should not contact the exposed pulp; (5) the paste of methylcellulose calcium hydroxide is applied to the exposed area without exerting pressure, and it is dried with a current of air until it has become completely hard; (6) the cavity is filled temporarily with a mixture of zinc-oxyphosphate cement; this should have a moderately thick consistency and also should be applied without pressure; (7) immediately after the closure of the exposed pulp is completed, a new roentgenogram is taken, and the patient is asked to return within 30 days for further observation. At that time a

new roentgenogram is taken and an electric vitality test given.

The paste of human dentin is prepared as follows: Normal teeth without caries and completely healthy are cleaned thoroughly (after they have been extracted), deprived of residuals of periodontal membrane, and put in a 10 per cent formaldehyde solution for three days. The tooth is then removed from the solution and thoroughly dried with sterile gauze. All the enamel and cement are detrited with carborundum disks and with fissure burs. The dentin, from crown to roots, is pulverized. The powder obtained is sterilized in the autoclave and mixed with an equal part of 10 per cent sulfathiazol ointment. The resulting paste is placed in Petri's boxes and kept ready for use. The technic followed for application of the dentin preparation is the same used in applying the mixture of methylcellulose calcium hydroxide, the only difference being that the layer of dentin paste is painted with a thin coat of "Repelac" varnish or of any other adequate varnish when it is applied to the exposed area. The coat of varnish is left to dry before the layer of cement is applied. Postoperative observations are made at intervals of from one to three months after the application of either treatment.

The results were equally satisfactory for both treatments. Healing of the exposed pulp and definitive restoration of the involved tooth were achieved. In either treatment it is indispensable to fulfill all the afore-mentioned requirements. The few failures observed were due to errors in the diagnosis or to defective technic in the application of the treatment.

Doctoral and Masters' dissertations



In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

Hydrolysis of procaine in the human oral cavity (Hidrólisis de la procaina por la encia humana). *Carolina Merino Jara*. 1953. CIR.DENT. Faculty of Odontology, University of Concepcion, Chile.

Influence of thyroid function on enzymic actions of blood serum produced by procaine and acetylcholine (Influencia de la función tiroidea en la acción enzimática del suero sanguíneo sobre la procaina y acetilcolina). *Enrique Contreras Munoz*. 1954. CIR.DENT. Faculty of Odontology, University of Concepcion, Chile.

Hydrolysis of procaine in oral and other organs of rabbits (Hidrólisis de la procaina por encia y otros tejidos en el conejo). *Celinda Salgado Yáñez*. 1955. CIR.DENT. Faculty of Odontology, University of Concepcion, Chile.

The sympathico-adrenal system in local anesthesia: clinical and experimental studies (Simpático-miméticos en anestesia local: estudio clinico y experimental). *Juan Ebensperger Besoain*. 1955. CIR.DENT. Faculty of Odontology, University of Concepcion, Chile.

Statistical analysis of incidence of ocular disease cures after elimination of dental foci (Statistische Untersuchungen über die Ausheilung von Augenkrankungen nach Sanierung dentaler Herde). *Erich Willms*. 1953. DR.MED.DENT. University of Freiburg/Breisgau, Germany.

Clinical experiments and comparative tests to evaluate the effectiveness of several new local anesthetics (Klinische experimentelle Vergleichsuntersuchungen über die anaesthesierende Wirksamkeit einiger neuerer Lokalanästhetica). *Werner Utz*. 1955. DR.MED.DENT. University of Tübingen, Germany.

Hydroxyl iontophoresis and copper hydroxide electrophoresis in the system of the root canals (Hydroxyl-Ionophorese und Cuprihydroxyd-Elektrophorese im Wurzelkanalsystem). *Hans Krapp*. 1955. DR.MED.DENT. University of Tübingen, Germany.

Surgical treatment in prognathism, micrognathia and open bite by operation in the mandibular region (Die operative Behandlung von Progenie, Mikrogenie und offenen Biss durch Eingriff am Unterkiefer). *Wilhelm Christian Müller*. 1955. DR.MED.DENT. University of Hamburg, Germany.

Tooth extraction, a microbiologic view (Die Zahnextraktion in mikrobiologischer Sicht). *J. D. V. Polauen*. 1955. DR.MED.DENT. University of Hamburg, Germany.

Chemotherapeutic and antibiotic treatment of sepsis lenta produced in albino rats (Chemotherapeutische und antibiotische Versuche bei der Streptokokkensepsis der weissen Maus). *Horst Froreich*. 1955. DR.MED.DENT. University of Hamburg, Germany.

Sialolithiasis (Über die Sialolithiasis). *Vita Graudins*. 1955. DR.MED.DENT. University of Hamburg, Germany.

Comparative tests to evaluate synthetic plastic materials such as "Agydent," "Kalegon," and "Polyprothen" (Vergleichende Untersuchungen in der Dauerbiegebeanspruchung von den Kunststoffen "Agydent," "Kalegon," und "Polyprothen"). *Getraute Franz-Flemming*. 1955. DR.MED.DENT. University of Hamburg, Germany.

Critical observation of the devitalization of pulp (Eine kritische Beobachtung der Pulpenvitalisation). *Gerd Hocotz*. 1955. DR.MED.DENT. University of Hamburg, Germany.

"Piacryl-SH" as a filling material for the deciduous dentition and its effects on the pulp ("Piacryl-SH" als Füllungsmaterial im Milchgebiss und seine Wirkung auf die Pulpa). *Heinz Meyer*. 1955. DR.MED.DENT. *University of Halle, Germany*.

Results obtained with Axhausen's method in surgical restoration of cleft lip and palate (Ergebnisse der Lippenspaltenoperationen nach Axhausen). *Hans Heinrich Boeckler*. 1955. DR.MED.DENT. *University of Halle, Germany*.

Roentgenographic examinations to define the so-called dislocations of the temporomandibular joint (Röntgenologische Untersuchungen zur Begriffsbestimmung der sogenannten Luxation im Kiefergelenk). *Hans Hunold*. 1955. DR.MED.DENT. *University of Halle, Germany*.

Do the different methods of surface treatment in stainless steel implants—mechanical, manual polishing, electrolytic glossing or coating with synthetic plastic materials—influence the tissue layers? (Hat die unterschiedliche Oberflächenbehandlung—mechanische Handpolitur, elektrolitische Glanzung oder Kunststoffüberzug—von Edelstahlimplantaten Einfluss auf ihr Gewebelager?). *Ekkehard Ficken*. 1954. DR.MED.DENT. *University of Kiel, Germany*.

Studies on the favorable prognosis of apicectomy: root canal fillings with standardized silver pegs after Rehrmann's method (Untersuchungen über die Erfolgsaussichten der Wurzelspitzenamputation unter besonderer Berücksichtigung der Füllung des Wurzelkanals mit genormten Silberstiften nach Rehrmann). *Werner Krug*. 1955. DR.MED.DENT. *University of Tübingen, Germany*.

Investigation of the etiologic and pathogenic problems in periodontal disease (Indagini sul problema etiologico e patogenetico della parodontosi). *Curzio Hruska*. 1955. DR.MED. & CHIR. ODONT. *Dental Clinic of the University of Pavia, Italy*.

Histochemical research on dental cementum and alveolar bone (Ricerche istochimiche sul cemento dentale e sull'osso alveolare). *Giancarlo Costa*. 1955. DR.MED. & CHIR. ODONT. *Dental Clinic of the University of Pavia, Italy*.

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CONTRIBUTING ABSTRACTERS

Finnish, Russian
 PAULA GOLLICK
 BARBARA KESSLER, M.D.

Greek
 GEORGE C. PHILIPPAS, D.D.S.

Japanese
 MASAO ONISI, D.M.S.C.

Scandinavian
 GUNNAR RYGE, D.D.S.

Spanish-Portuguese
 ELOISA DEBARROSO
 JOSEFA THORNTON
 GEORGE FRENCH, D.D.S., M.D.

Medical
 A. F. BARANOFF, D.D.S.



